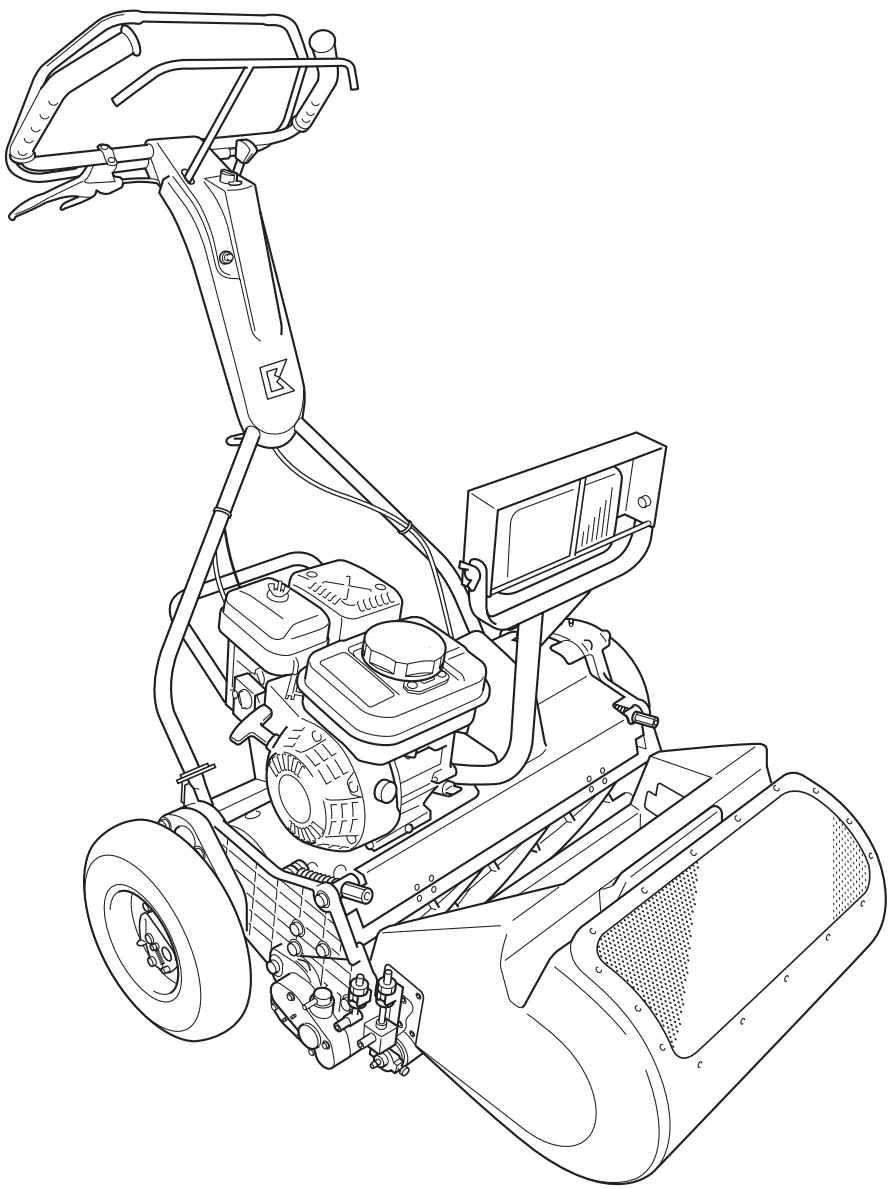
BARONESS®

GREENS MOWERS

LM18G LM56G LM66T

Service Manual Ver.1.3



Introduction

This service manual describes the steps to maintain the Baroness Greens Mower LM18G, LM56G and LM66T as well as the resources for diagnosing malfunctions and other issues.
The content is organized by categories of representative maintenance methods.
Please refer to the appropriate chapter to address your mower's particular condition.
Please note that there are no steps described in this manual for disassembling and maintaining engine and other parts that are specifically to be repaired by the manufacturer.
Please contact the dealer where you purchased the product or Kyoeisha USA for a repair request.

Kyoeisha USA, Inc.

Notes

- The specifications described in this manual are current as of December 2009.
  There may be some changes made to the content of this manual for improvement at any time without notice.
- When replacing parts, please always use genuine parts or those specified by Kyoeisha USA.
  Kyoeisha USA will not be responsible for the malfunction caused by the use of parts other than genuine parts.

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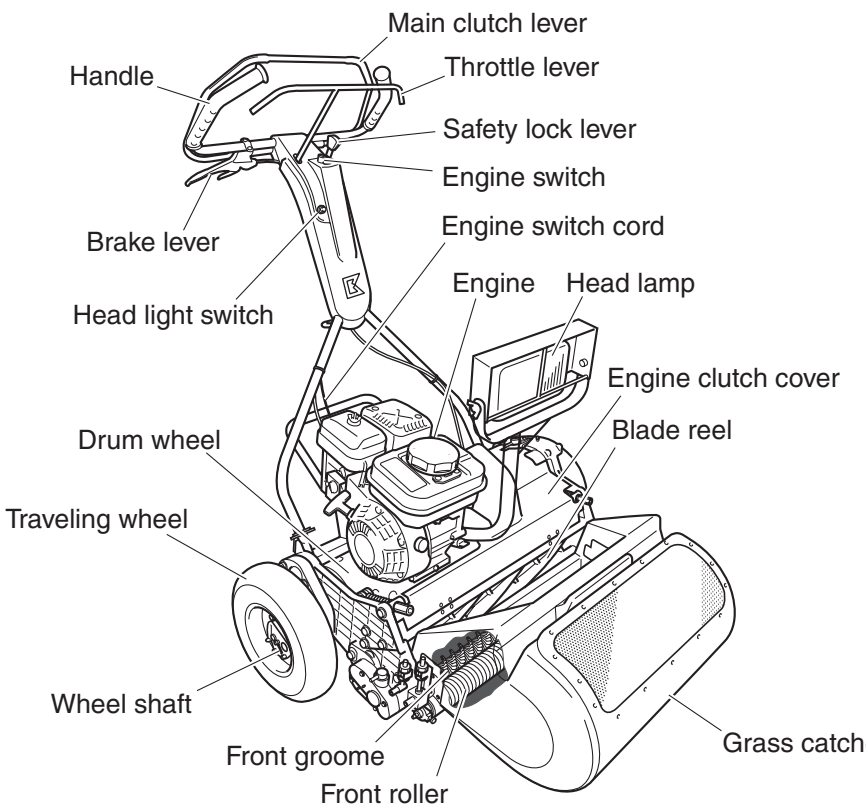
Specifications

Model		LM18G	LM56G	LM66T
Length (with grass catcher)		54.5 in. (138.5cm)	55.3 in. (140.5cm)	
Width (without travelling wheels)		33.1 in. (84.2cm)	37 in. (94.2cm)	40 in. (103cm)
Height (handle)		45.2in. (114.7 cm)		
Mowing weight	no groomer	211 lbs. (95.7kg)	202 lbs. (91.5kg)	214 lbs. (97kg)
	fully optioned	218 lbs. (99kg)	236 lbs. (107kg)	223 lbs. (101kg)
Mowing section	Mowing width	18 in. (45.6cm)	22 in. (55.6cm)	26 in. (64.6cm)
	Reel diameter	5.04 in. (ø 12.8cm)		
	Number of reel blades	11	9(option), 11	7, 9, or 11
	Cutting height (min.~ max.)	0.08 in.~1.14 in. (2.0mm~28.5mm)		
	Eff cutting height (min. ~ max.)	*0.10 in.~0.35 in. (2.5mm~9mm)	*0.10 in.~1.06 in. (2.5mm~27mm)	
	Speed (km/h)	4.8 km/h (3 mph) @3,000 rpm		
Engine		Honda GX120U1 2.6 kw (3.5 hp) / 3,600 rpm		

*** When equipped with 1.5 mm bedknife.**

Model		LM18G	LM56G	LM66T
Front groomer	Working width	16.4 in. (41.8cm)	20 in. (51cm)	23.6 in. (60cm)
	Number of Blades	64	78	92
Dethatching Reel	Working width	16.2 in. (41.1cm)	20 in. (51cm)	23.6 in. (60cm)
	Number of Blades	32	39	46
Rotary Brush	Working width	15.3 in. (38.9cm)	19.3 in. (49cm)	22.4 in. (57cm)
	Turning Diameter	2.4in. (6cm)	2.4in. (6cm)	2.4in. (6cm)

Part Names



Maintenance Schedule

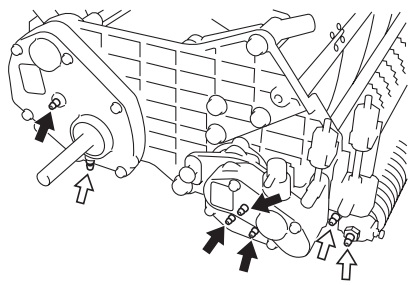
	Maintenance	Before use	Every 8hr	Every 10hr	Every 50hr
Engine	Cleaning of each part/inspection of tightening	○			
	Inspection and addition of fuel	○			
	Inspection and cleaning of air cleaner	○			
	Inspection and addition of engine oil	○			
	Engine oil change [SAE30/0.6dm^3 (0.6L)]		Only after the initial operation		○
Main unit	Inspection and cleaning of recoil starter dust proofing net	○			
	Cleaning of each part/inspection of tightening	○			
	Inspection and adjustment of blade engagement	○			
	Inspection and adjustment of mowing height	○			
	Greasing and oiling			○	○
	Removal of mown grass and dust	○			

Locations for Greasing

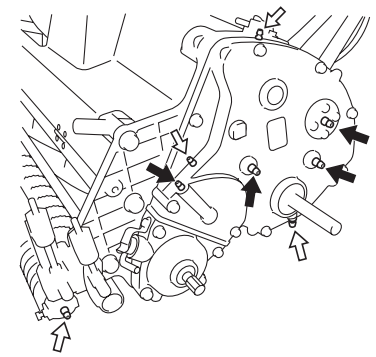
Periodically fill up respective grease nipples.
Exercise special care when greasing the sections where needle bearings are used.
(Intermediate shaft of the right and left gears and the intermediate shaft of the groomer)
Periodically fill up the grease nipples with approx. 1 g of grease (EXCELITE EP No.2) (one or two times with a compact manual grease pump).

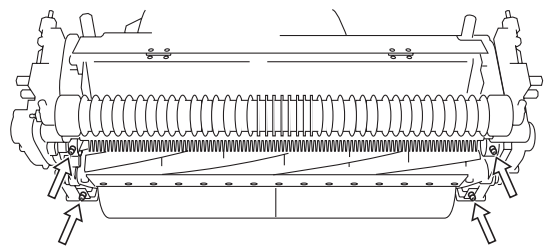
Every 10hr (➡)	Every 50hr (⇨)
Left frame intermediate shaft (for Reel)	Left gear cover
Right & left frame intermediate shaft (for Drum)	Reel bearing
Differential gear parts	Front roller
Vertical gear case intermediate shaft	Vertical gear case
	Drum housing

Right-side main unit



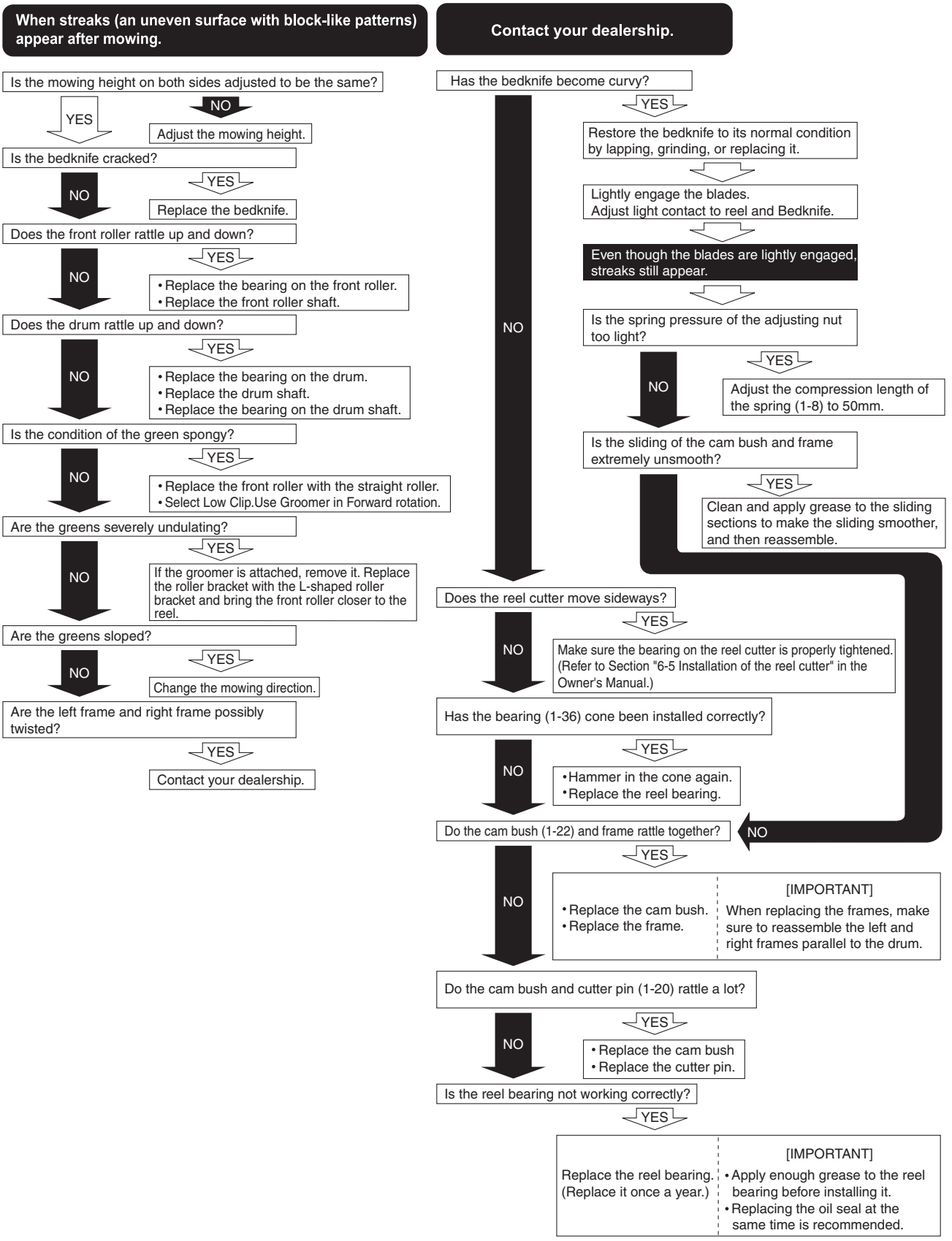
Left-side main unit



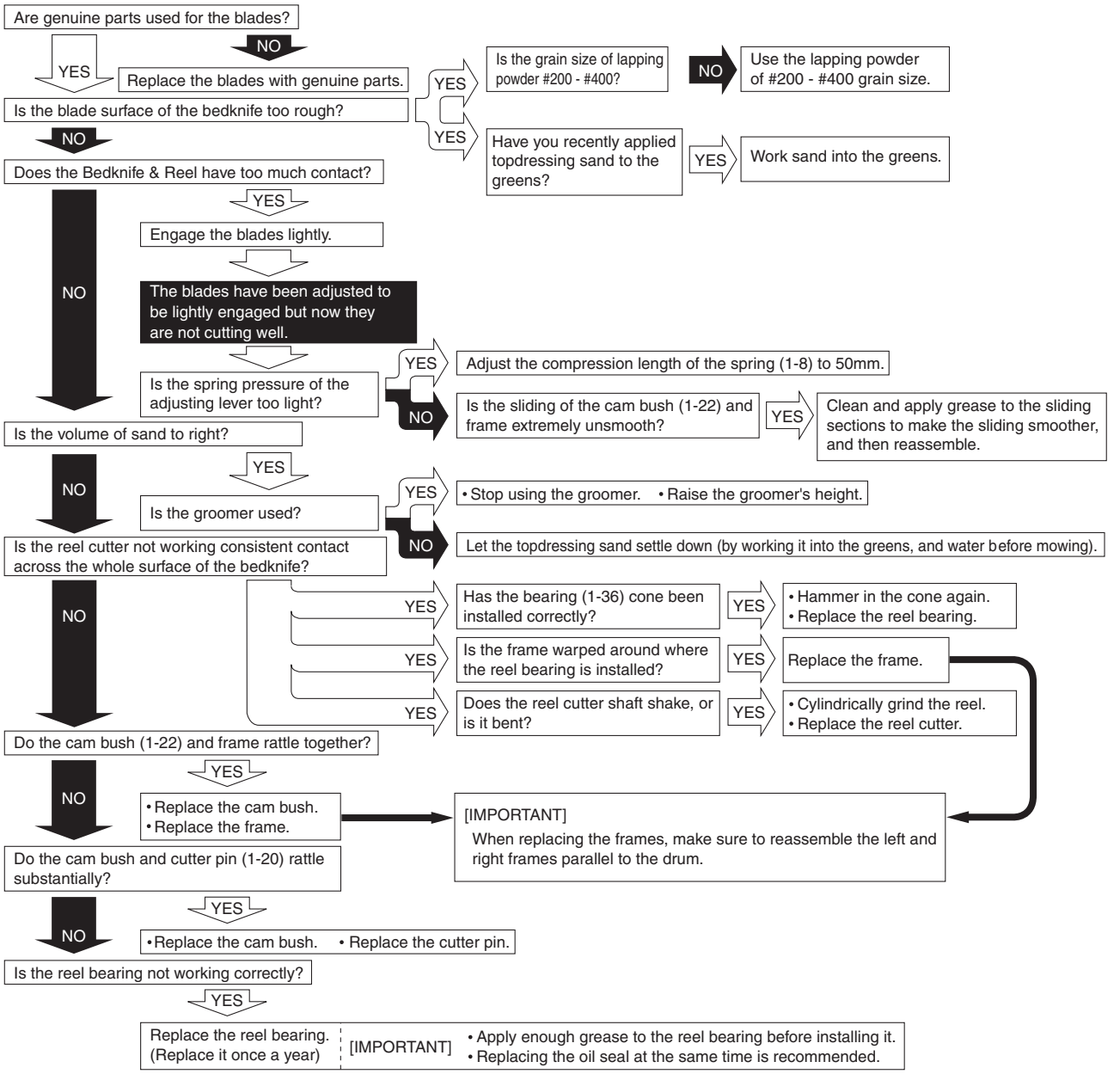


Every 10hr ➡
Every 50hr ⇨

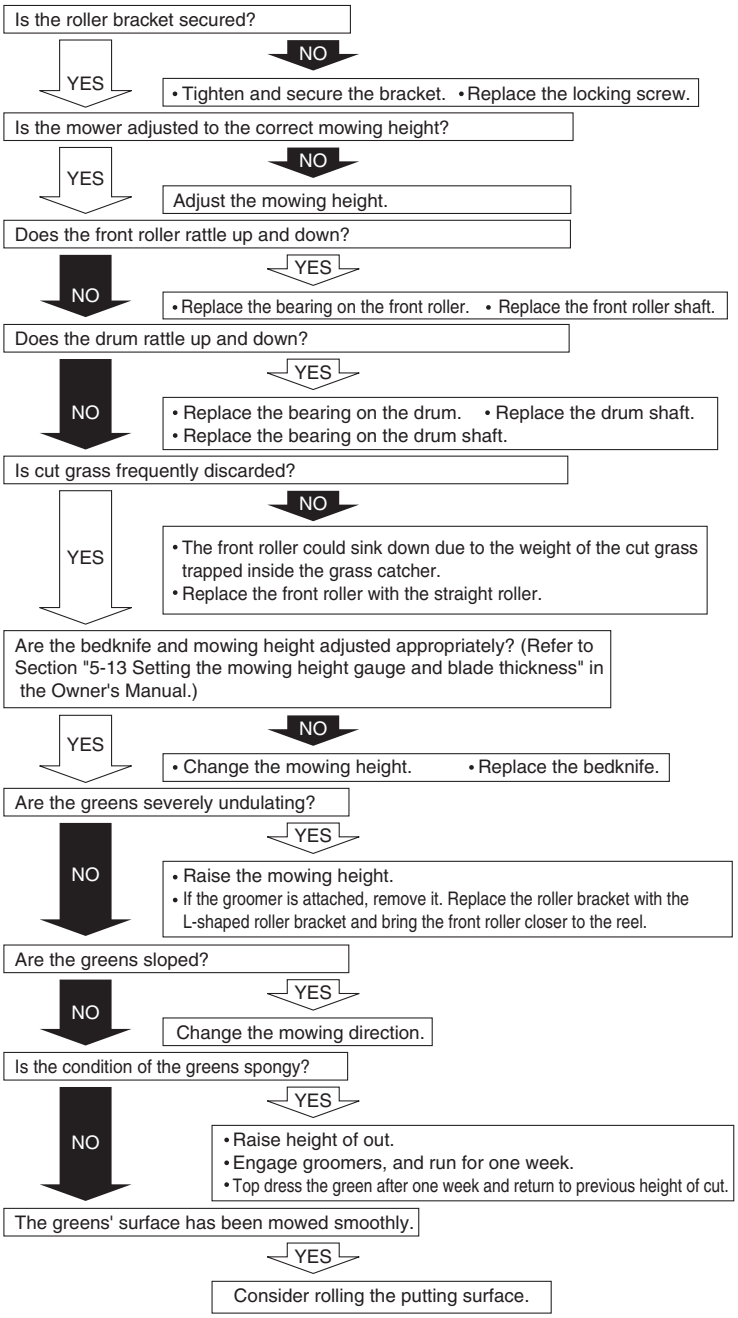
How to Handle a Product Malfunction


When streaks (an uneven surface with block-like patterns) appear after mowing.
Is the mowing height on both sides adjusted to be the same?
NO
Adjust the mowing height.
YES
Is the bedknife cracked?
YES
Replace the bedknife.
NO
Does the front roller rattle up and down?
YES
• Replace the bearing on the front roller.
• Replace the front roller shaft.
NO
Does the drum rattle up and down?
YES
• Replace the bearing on the drum.
• Replace the drum shaft.
• Replace the bearing on the drum shaft.
NO
Is the condition of the green spongy?
YES
• Replace the front roller with the straight roller.
• Select Low Clip.Use Groomer in Forward rotation.
NO
Are the greens severely undulating?
YES
If the groomer is attached, remove it. Replace the roller bracket with the L-shaped roller bracket and bring the front roller closer to the reel.
NO
Are the greens sloped?
YES
Change the mowing direction.
NO
Are the left frame and right frame possibly twisted?
YES
Contact your dealership.
Contact your dealership.
Has the bedknife become curvy?
YES
Restore the bedknife to its normal condition by lapping, grinding, or replacing it.
Lightly engage the blades.
Adjust light contact to reel and Bedknife.
Even though the blades are lightly engaged, streaks still appear.
Is the spring pressure of the adjusting nut too light?
YES
Adjust the compression length of the spring (1-8) to 50mm.
NO
Is the sliding of the cam bush and frame extremely unsmooth?
YES
Clean and apply grease to the sliding sections to make the sliding smoother, and then reassemble.
NO
Does the reel cutter move sideways?
YES
Make sure the bearing on the reel cutter is properly tightened. (Refer to Section "6-5 Installation of the reel cutter" in the Owner's Manual.)
NO
Has the bearing (1-36) cone been installed correctly?
YES
• Hammer in the cone again.
• Replace the reel bearing.
NO
Do the cam bush (1-22) and frame rattle together?
NO
YES
• Replace the cam bush.
• Replace the frame.
[IMPORTANT]
When replacing the frames, make sure to reassemble the left and right frames parallel to the drum.
NO
Do the cam bush and cutter pin (1-20) rattle a lot?
YES
• Replace the cam bush
• Replace the cutter pin.
NO
Is the reel bearing not working correctly?
YES
Replace the reel bearing. (Replace it once a year.)
[IMPORTANT]
• Apply enough grease to the reel bearing before installing it.
• Replacing the oil seal at the same time is recommended.

The blades become dull only after mowing one or two holes.


Are genuine parts used for the blades?
YES
NO
Replace the blades with genuine parts.
Is the blade surface of the bedknife too rough?
YES
Is the grain size of lapping powder #200 - #400?
NO
Use the lapping powder of #200 - #400 grain size.
YES
Have you recently applied topdressing sand to the greens?
YES
Work sand into the greens.
NO
Does the Bedknife & Reel have too much contact?
YES
Engage the blades lightly.
NO
The blades have been adjusted to be lightly engaged but now they are not cutting well.
Is the spring pressure of the adjusting lever too light?
YES
Adjust the compression length of the spring (1-8) to 50mm.
NO
Is the sliding of the cam bush (1-22) and frame extremely unsmooth?
YES
Clean and apply grease to the sliding sections to make the sliding smoother, and then reassemble.
Is the volume of sand to right?
NO
YES
Is the groomer used?
YES
• Stop using the groomer. • Raise the groomer's height.
NO
Let the topdressing sand settle down (by working it into the greens, and water before mowing).
Is the reel cutter not working consistent contact across the whole surface of the bedknife?
NO
YES
Has the bearing (1-36) cone been installed correctly?
YES
• Hammer in the cone again.
• Replace the reel bearing.
YES
Is the frame warped around where the reel bearing is installed?
YES
Replace the frame.
YES
Does the reel cutter shaft shake, or is it bent?
YES
• Cylindrically grind the reel.
• Replace the reel cutter.
Do the cam bush (1-22) and frame rattle together?
YES
NO
• Replace the cam bush.
• Replace the frame.
[IMPORTANT]
When replacing the frames, make sure to reassemble the left and right frames parallel to the drum.
Do the cam bush and cutter pin (1-20) rattle substantially?
YES
NO
• Replace the cam bush. • Replace the cutter pin.
Is the reel bearing not working correctly?
YES
Replace the reel bearing. (Replace it once a year)
[IMPORTANT]
• Apply enough grease to the reel bearing before installing it.
• Replacing the oil seal at the same time is recommended.

If scraping occurs


Is the roller bracket secured?
NO
• Tighten and secure the bracket. • Replace the locking screw.
YES
Is the mower adjusted to the correct mowing height?
NO
Adjust the mowing height.
YES
Does the front roller rattle up and down?
YES
• Replace the bearing on the front roller. • Replace the front roller shaft.
NO
Does the drum rattle up and down?
YES
• Replace the bearing on the drum. • Replace the drum shaft.
• Replace the bearing on the drum shaft.
NO
Is cut grass frequently discarded?
NO
• The front roller could sink down due to the weight of the cut grass trapped inside the grass catcher.
• Replace the front roller with the straight roller.
YES
Are the bedknife and mowing height adjusted appropriately? (Refer to Section "5-13 Setting the mowing height gauge and blade thickness" in the Owner's Manual.)
NO
• Change the mowing height. • Replace the bedknife.
YES
Are the greens severely undulating?
YES
• Raise the mowing height.
• If the groomer is attached, remove it. Replace the roller bracket with the L-shaped roller bracket and bring the front roller closer to the reel.
NO
Are the greens sloped?
YES
Change the mowing direction.
NO
Is the condition of the greens spongy?
YES
• Raise height of out.
• Engage groomers, and run for one week.
• Top dress the green after one week and return to previous height of cut.
NO
The greens' surface has been mowed smoothly.
YES
Consider rolling the putting surface.

Required Tools

***Tool sizes are indicated in mm.**

Screw wrench	7 • 10 • 13 • 17 • 19 • 22 x 1 • 24 x 2
Allen key wrench	2 • 5 • 6
Longnose pliers	
Pin remover	4
Stop ring pliers	For opening & closing
Screwdriver	Flathead x 2
Slide gauge	
Clearance gauge (thickness gauge)	0.5 x 2 (included tool)
Hammer	Metal, wooden, plastic
Other	Magic marker, mowing height gauge, waste cloth, round bar Tool to hammer bearings Support to prevent engine oil from spilling when the engine tilts

Notes for Inspection

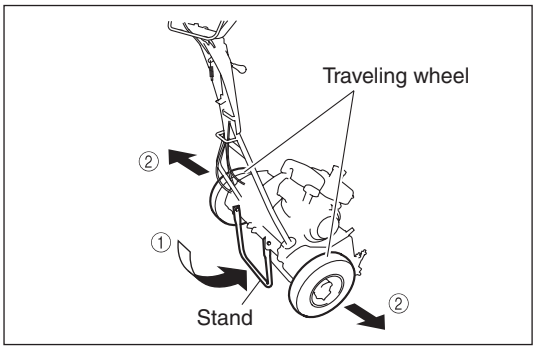
- Always refer to this service manual as well as the owner's manual when inspecting the mower.
- During the inspection and operation of the mower, always wear gloves.
- "Left" and "right" directions in this manual are based on the viewpoint of the operator holding the handle of the mower and facing the mowing direction.

⚠ CAUTION
- When inspecting and repairing the mower, place it on a level surface and make sure all the parts are in OFF position.

⚠ WARNING
- The build-up of cut grass and other debris at the intakes for engine cooling air and air cleaner, or the muffler and exhaust pipe could lead to engine malfunction and overheating which could cause a fire. When you see this build-up, stop the operation immediately. After the heated area cools down enough, remove the build-up.
- Do not touch the muffler and engine either during or right after operation as those areas can be dangerously hot. This could cause burns.
- Always keep clean the safety symbols and instructions attached to the mower. If they are lost or damaged, replace them immediately with new ones.
- Do not alter the machine. When replacing parts and grease, use those specified by Kyoeisha USA.

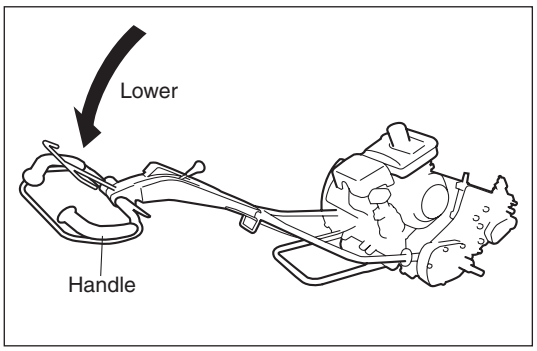
  The operation of a machine that has been altered or installed with parts other than those specified by Kyoeisha USA could lead to mechanical damage or accident.

[1] Replacing reel cutter and bedknife

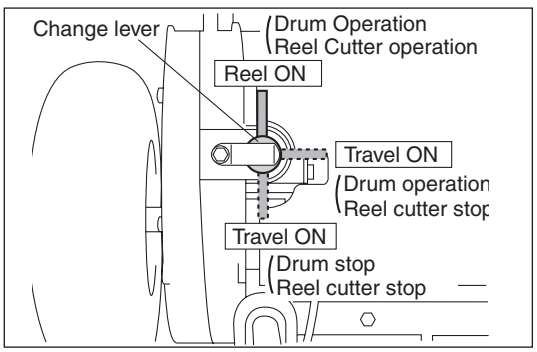


* Please always wear gloves during this replacement as it could be dangerous.

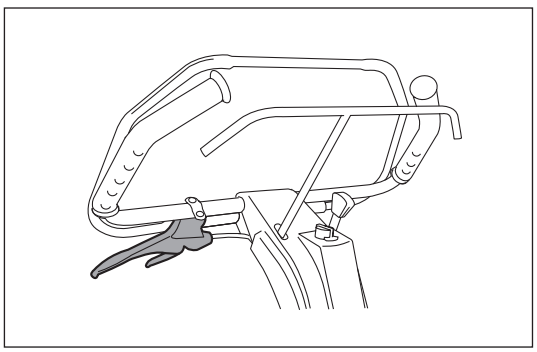
1) Set up the stand first, and then remove the traveling wheels on both sides.



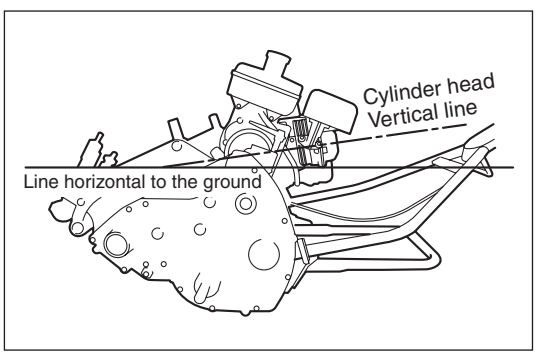
2) Place the mower on a stable workbench and lower the handle.



3) Always set the change lever located at the top of the left frame to the “Travel ON” position in order to keep the mower from moving.

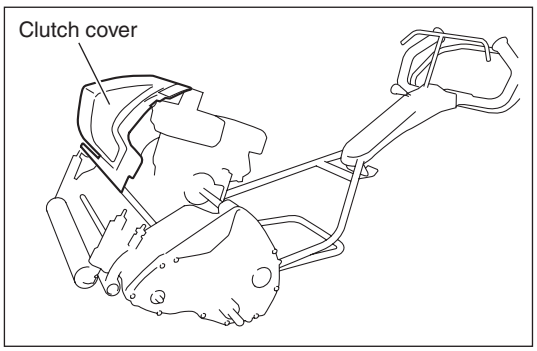


4) Engage parking brake.

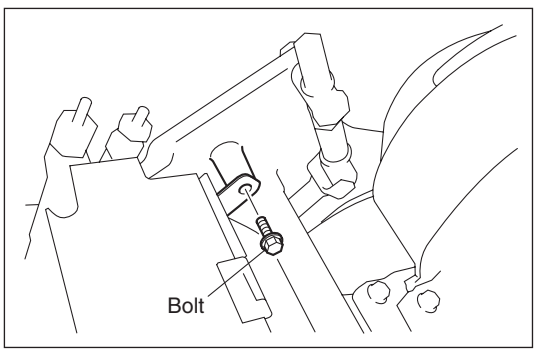


5) If the engine is tilted, engine oil may spill out.

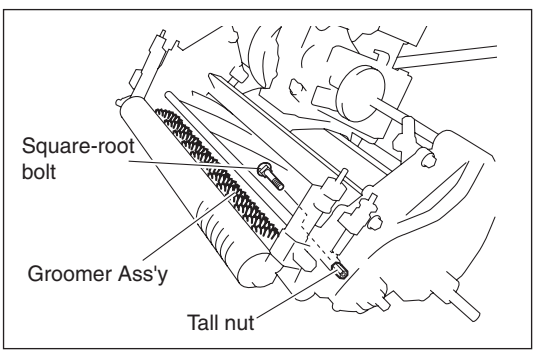
* Please keep the cylinder head’s vertical line slightly above the line horizontal to the ground.



6) Open the clutch cover [5-1,2,50].

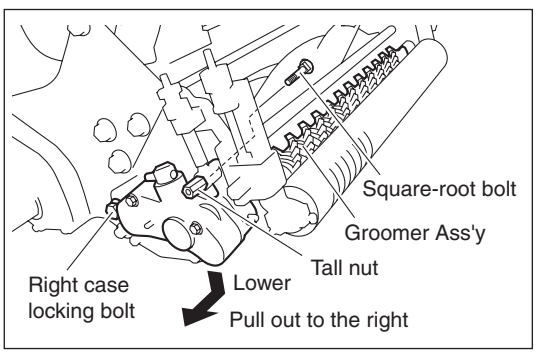


7) Remove the bolts [1-25] on both sides that are holding the reel cover.

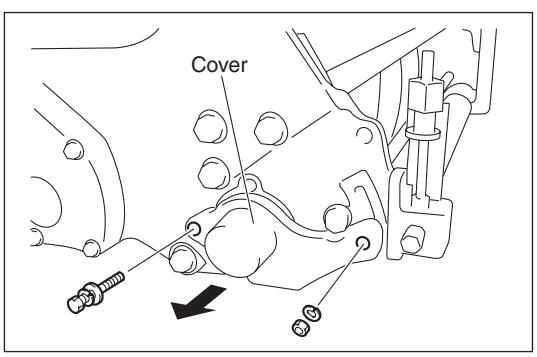


Models equipped with a groomer

8) Unscrew the tall nuts [8-58] on both sides and the right case locking bolt [8-60], and then remove the groomer Ass'y.



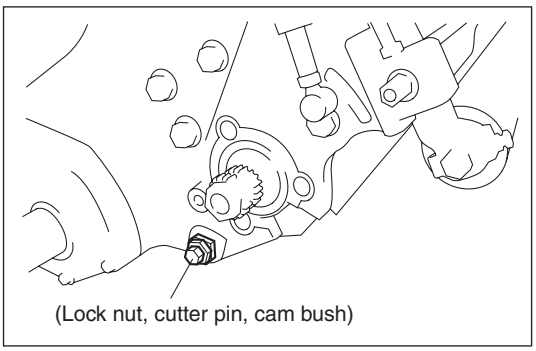
* Lower the entire groomer Ass'y, and then pull it out to the right after the groomer's blade comes out of the groove on the front roller.



Models not equipped with a groomer

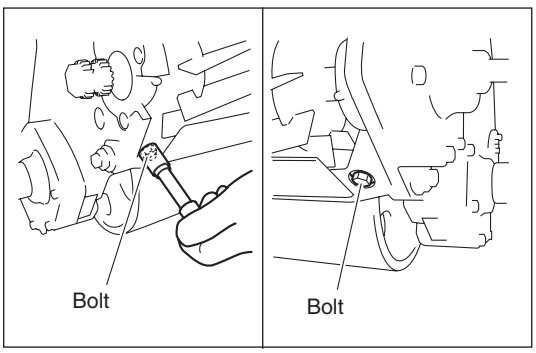
Remove the front roller.

(Please refer to #1 - #4 of Section 12 on page 39, and #2 of Section 13 on page 44.)

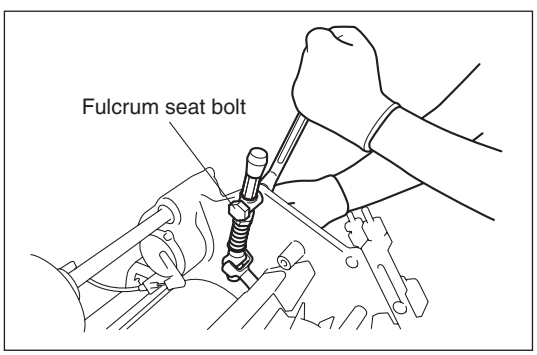


9) Loosen the lock nut [1-21] on the cutter pin on both sides, and then loosen the cutter pins [1-20].

* When the blade adjusting nut [1-1] is tightened, the bedknife is lowered (to avoid contact between the reel and bedknife at the time of assembly).

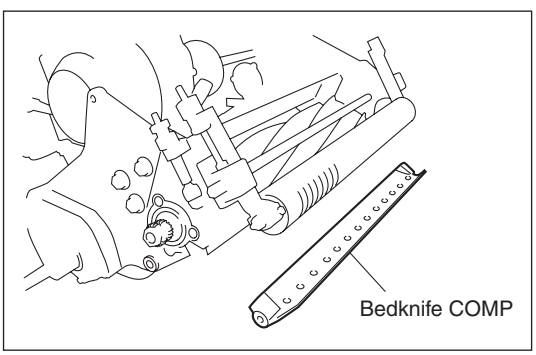


10) Remove the two bolts [1-25] that secure the bedknife base arm and bedknife base COMP.



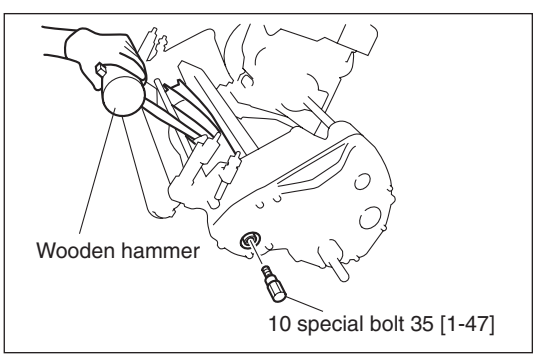
11) Unscrew the fulcrum seat bolt [1-4], and remove the bedknife base arm [1-11] from the bedknife base.

* Please keep 1-5 pieces of 0.4SPCC washer1220 for clearance adjustment between the fulcrum seat [1-5] and the frame [6-32, 43] if there are any of them.



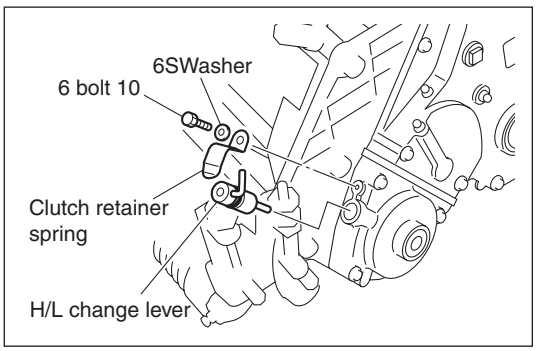
12) While supporting the bedknife base COMP, remove the cutter pin [1-20].

* Please be careful when you remove the cutter pin as the bedknife base COMP may fall off.

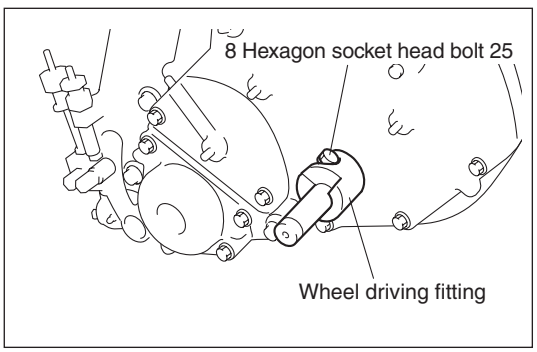


13) Insert an item such as a wooden hammer handle into the reel cutter to prevent the reel from turning, and remove the 10 special bolt 35 [1-47].

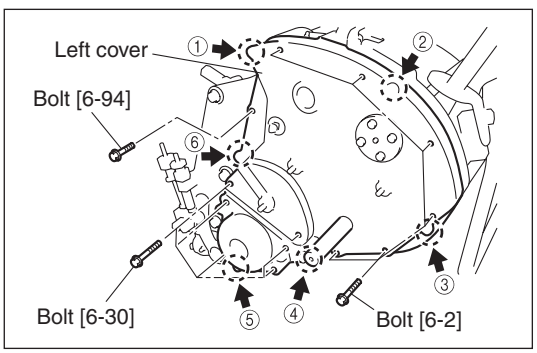
* Please do not use a hard object such as an iron bar.



14) Remove the 6 bolt 10 , 6 S Washer , Clutch retainer spring [6-56], and remove the H/L change lever [6-91] from left side cover.

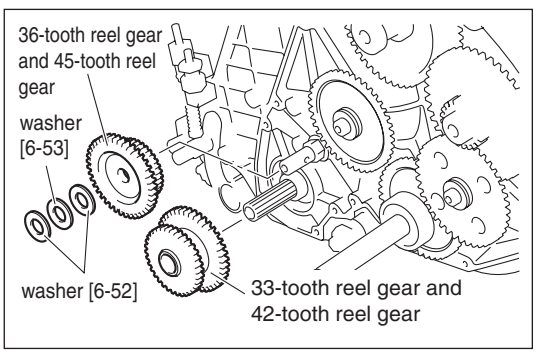


15) Loosen the hexagon socket head bolt on the wheel driving fitting, amd then remove the fitting. Remove the key [4-11] from the drum shaft.

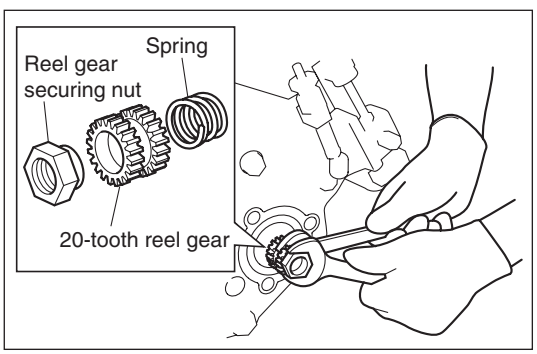


16) Unscrew the six bolts [6-2], six bolts [6-30], one bolt [6-94], and then detach the left cover [6-89].

* Do not force open the cover using an object such as a screwdriver as it will scratch the adjoining surfaces.
If the cover doesn't come off easily, remove it by tapping those six locations (indicated by the arrows in the left illustration) lightly with a wooden hammer.

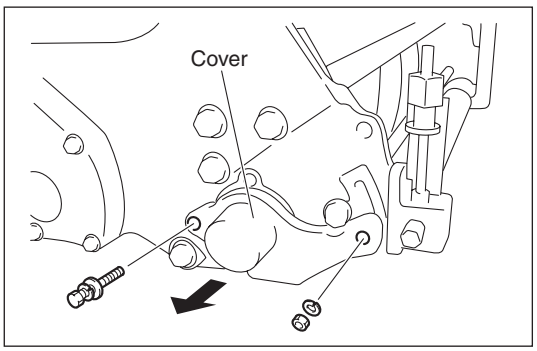


17) Remove the washer [6-52,53], 36-tooth reel gear and 36-tooth / 45-tooth reel gear [6-54], 33-tooth reel gear and 42-tooth reel gear [1-46].



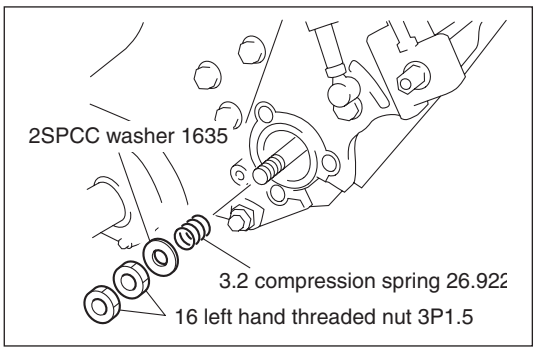
18) Remove the reel gear securing nut [8-45] from the right frame, then the 20-tooth reel gear [8-46], and then the spring [1-35].

* The nut is left-hand threaded.
The 20-tooth reel gear has a specific orientation. (Please confirm the orientation beforehand by referring to [6-5] on page 14 of the owner's manual.)



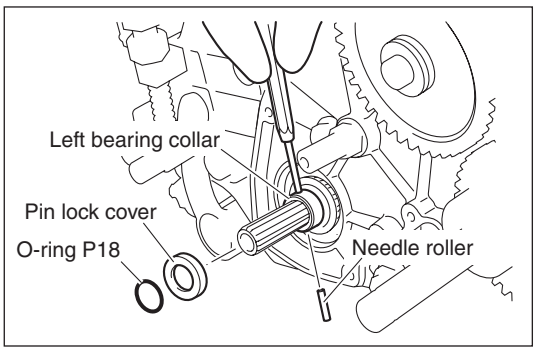
Models not equipped with a groomer

Remove the bolt and nut, and detach the cover [1-28].



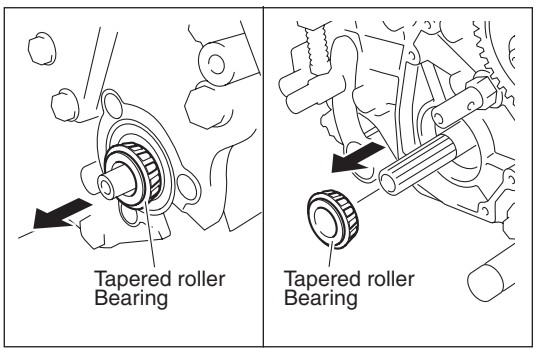
Remove the two left nuts [1-32], washer [1-34], and spring [1-35].

* The nuts are left-hand threaded.

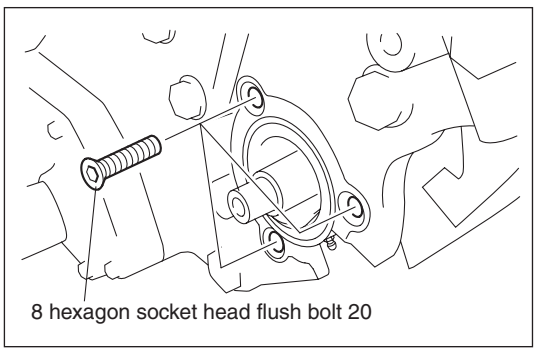


19) Detach the O-ring P18 [1-33] and the pin lock cover [1-44] from the reel shaft on the left frame, and using a pin remover remove the needle roller [1-45] and left bearing collar [1-43].

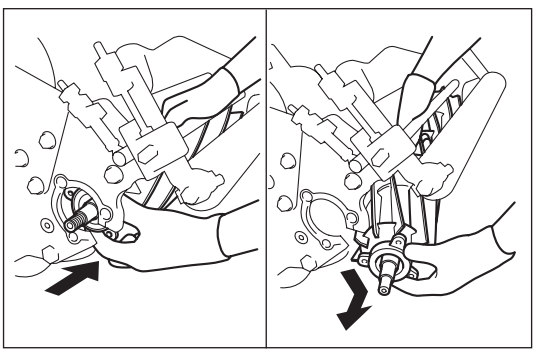
* Make sure that the 20-tooth reel gear has been removed.



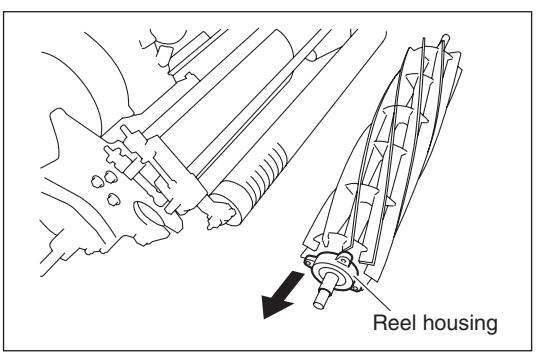
20) Remove the tapered roller bearing [1-36] on both sides.



21) Unscrew the three 8 hexagon socket head flush bolt 20 [1-37] from the right frame using an Allen wrench (5 mm).

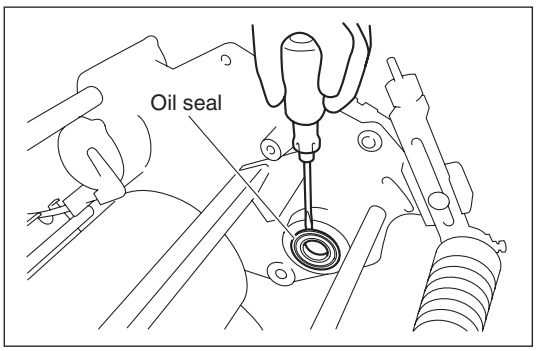


22) While supporting the reel cutter, push the right reel housing [1-58] inward. Then remove the reel cutter downward and pull it out from the left frame.



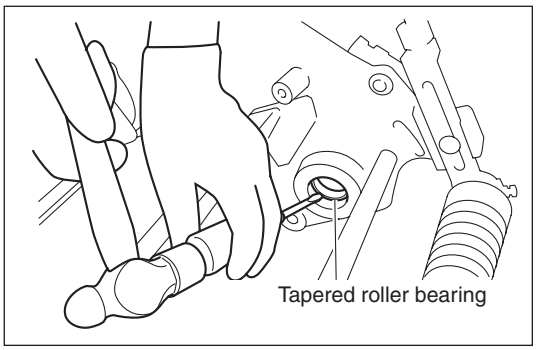
23) Remove the right reel housing [1-58].

[2] How to replace the oil seal and tapered roller bearing



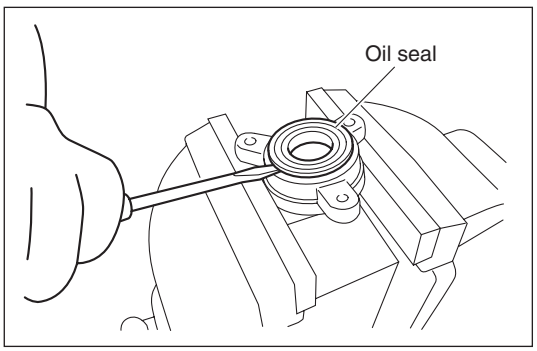
1) Using a flathead screwdriver, remove the oil seal [1-38].

* Be careful not to scratch the frame.



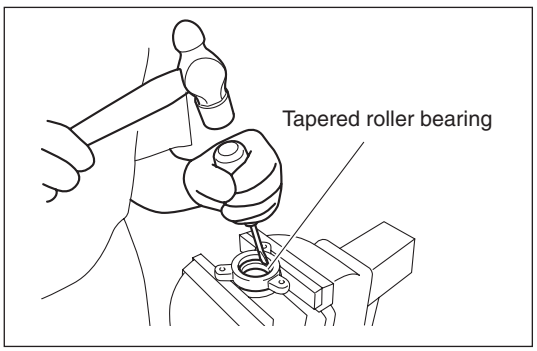
2) Remove the bearing core[1-36] by hammering a flathead screwdriver equally around the bearing.
(Pay attention to the direction of hammering.)

* Since the outer bearing is not pressed fit, you can remove it smoothly by keeping it parallel to the housing as you pull it out.



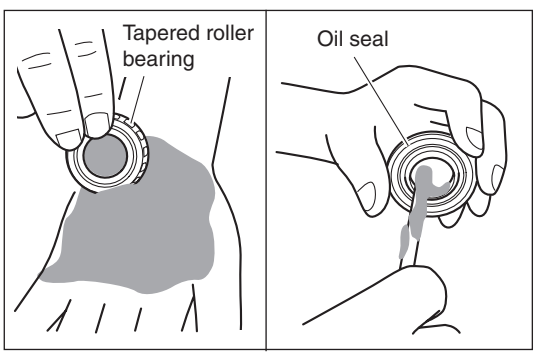
3) First, secure the right reel housing [1-58] with a vice, and then remove the oil seal [1-38] using a flathead screwdriver.

* Be careful not to scratch the right reel housing.

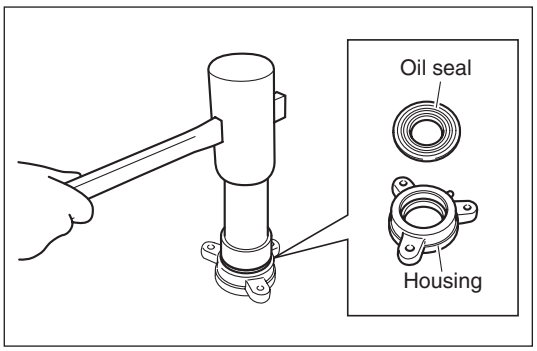


4) Remove the bearing core [1-36] by hammering a flathead screwdriver into it.

* Since the outer bearing is not pressed fit, you can remove it smoothly by keeping it parallel to the housing as you pull it out.

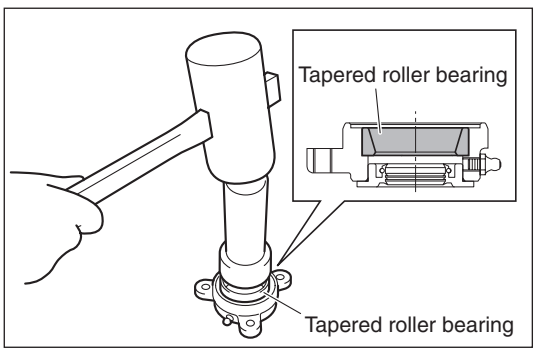


5) Prepare the oil seal and tapered roller bearing. Make sure that you always replace with a new part.
When replacing the tapered roller bearing [1-36], both the core and bearing must be replaced as a set.
Grease the oil seal [1-38] and tapered roller bearing [1-36]. (Rub enough grease on the tapered roller bearing so that the grease may come out from the other side. Apply enough grease on the lip surface of the oil seal.)



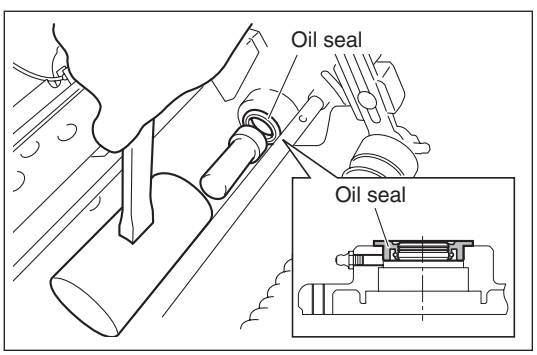
6) Hammer the oil seal [1-38] into the housing.

* The oil seal needs to be hammered deep inside while paying attention to the direction of the housing and oil seal.

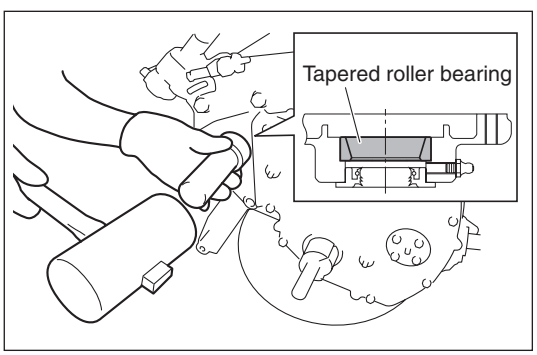


7) Hammer the tapered bearing core [1-36] into the housing [1-58].

* Please make sure that the direction of the bearing is parallel to the housing.

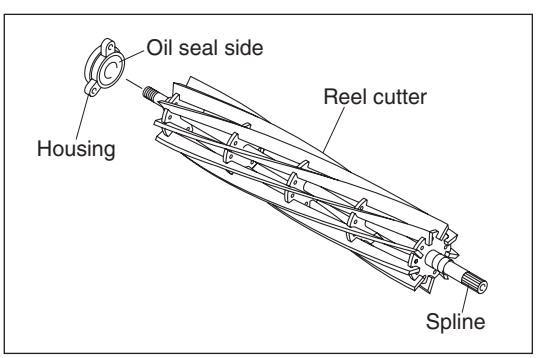


8) Hammer the oil seal [1-38] from the inside.



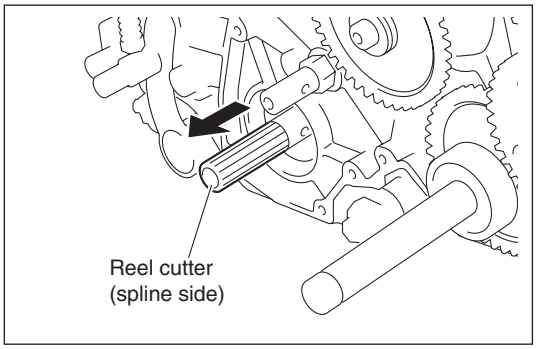
9) Hammer the tapered bearing core [1-36] from the outside.

* Please make sure that the outer bearing is going in parallel to the housing.



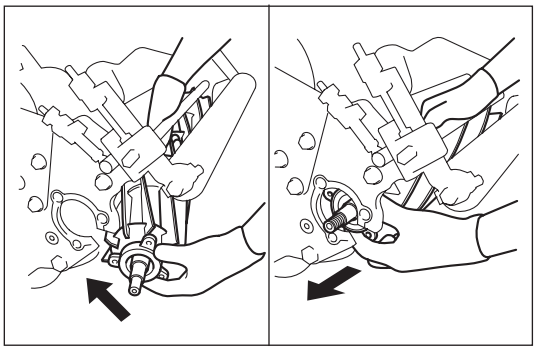
10) Install the housing on the reel cutter [1-39,40,41,42,63,71] while paying attention to the direction of the housing.

* Be careful not to damage the oil seal.



11) Insert the spline side of the reel cutter into the left frame [6-43].

* Be careful not to damage the oil seal.



12) Set up the reel cutter by reversing the steps to remove it.

* Please refer to pages 12-12).
(Install the right reel housing on the right frame.)

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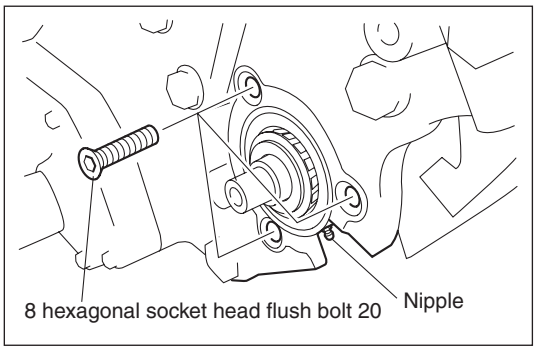
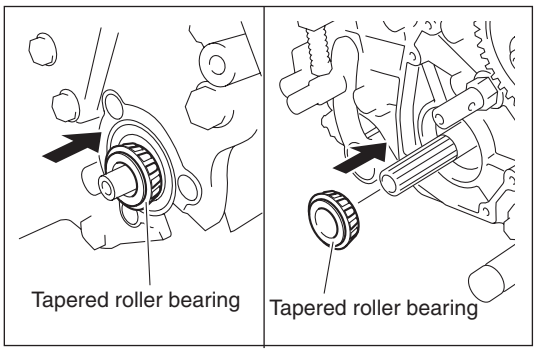
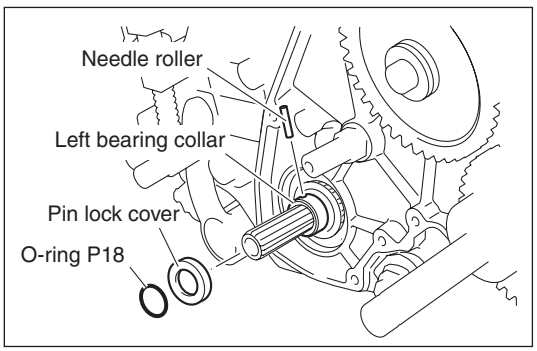
確認お願いします。



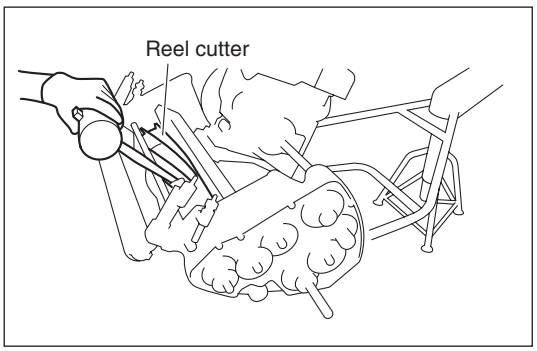
13) Set the right reel housingÅfs grease nipple at the notch of the frame, and secure it using the three hexagon socket head counter sunk bolts [1-37].



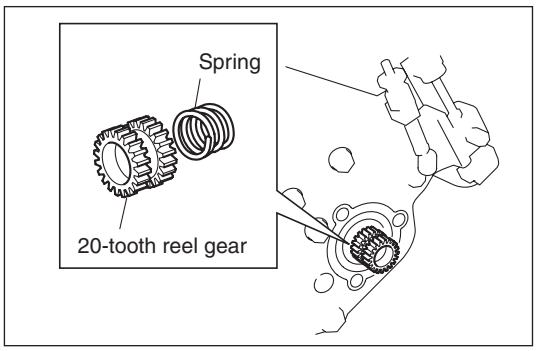
14) Install the tapered roller bearings [1-36] to the reel cutter and make sure the tapered side faces in.



15) Install the left bearing collar [1-43] to the reel shaft, and, after matching the holes on the collar and shaft, insert the needle roller [1-45] into the holes. Install the pin lock cover [1-44], and the O-ring P18 [1-33], and install the 33-tooth reel gear and 42-tooth reel gear [1-46], 36-tooth reel gear and 45-tooth reel gear [6-54] while marking sure the direction of the gear is small side out.



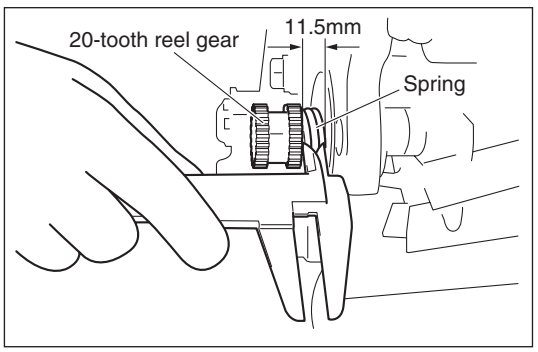
16) Insert an item such as a wooden hammer handle into the reel cutter to prevent the reel from turning.



17) Set the spring [1-35] and the gear [8-46] on the right reel housing while making sure that the direction and the order are correct.

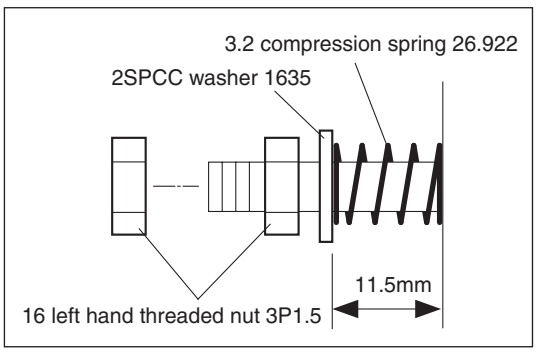
* The gear and nut are left-hand threaded.

* Make sure that the left bearing, and pin rock cover, O-ring are set.



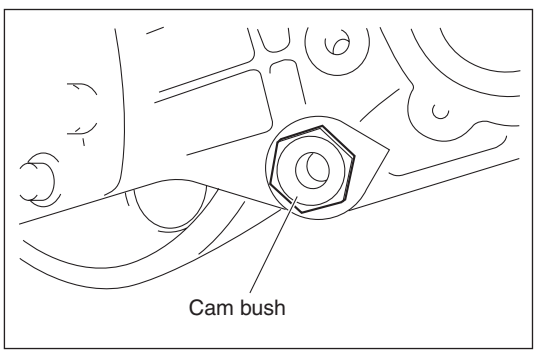
18) Tighten the 20-tooth reel gear [8-46] all the way once and make sure the bearing is fitted properly.
Then, adjust the length of the spring to 11.5mm while loosening the 20-tooth reel gear, and secure it using the reel gear securing nut [8-45].

* They are left-hand threaded.



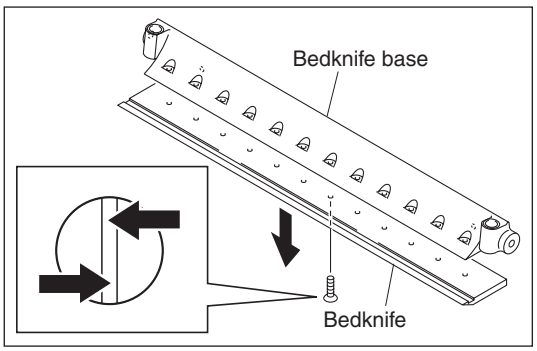
Models not equipped with a groomer

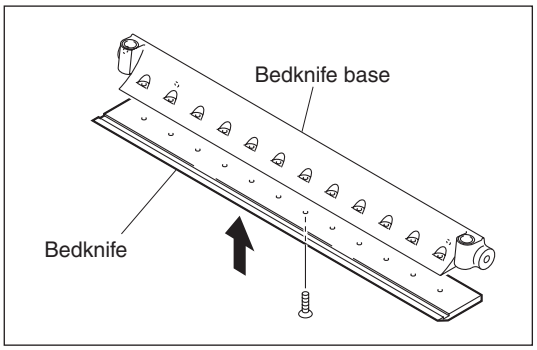
Tighten the nut all the way once, and then adjust the length of the spring to 11.5mm using a slide gauge.
Secure the spring with the lock nut [1-32].
Grease both the tapered roller bearing [1-36] and the spring [1-35].



19) Make sure that the cam bush [1-22] moves smoothly without any excessive play in it.

[3] How to replace the bedknife





* Place the bedknife COMP on a stable workbench during the replacement.
Remove the bedknife [1-17,18,64,65,66,67,68] by loosening the screw [1-19] with an impact driver or punch.

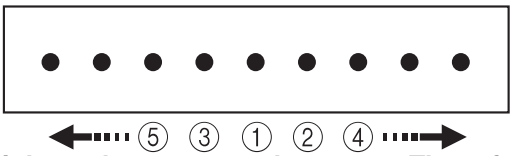
Attaching the bedknife

Place the bedknife base [1-15,16,69] on a stable workbench and attach the bedknife [1-17,18,64,65,66,67,68] to it.

* Clean up, without scratching, the surface on the bedknife base where the bedknife is attached.

* Tighten the screws [1-19] uniformly with an impact driver. Replace the old screws with new ones.

The order of tightening the screws

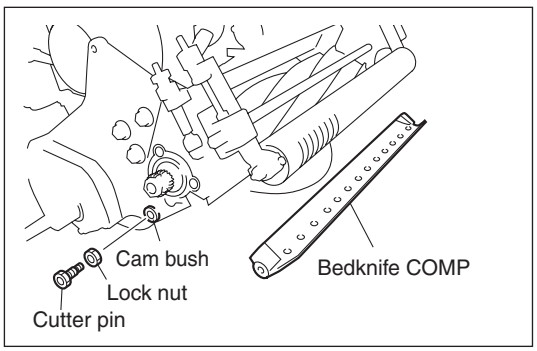


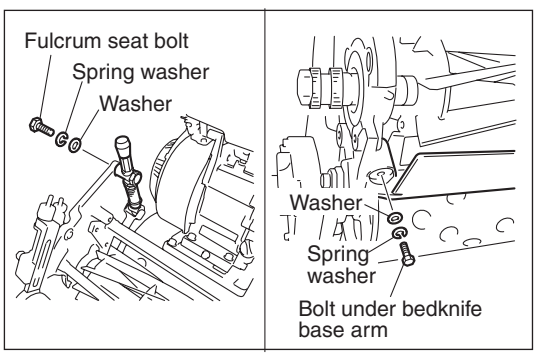
First, tighten the screw at the center. Then, follow the numerical order, first to the right and then to the left, as shown above.

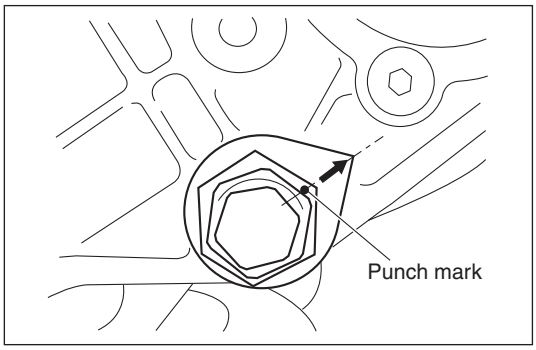
Edges in parallel

1) Install the bedknife COMP [1-15,16,69] on the mower.
Using your hand, tighten the cutter pin [1-20] on both sides as far as it goes.
2) Install the bedknife base arm on both sides.
Make sure the cam bush is inside the frame.
   1. Insert the bedknife base arm [1-11] into the bedknife base.
   2. Temporarily secure the bedknife base arm with the fulcrum seat bolt [1-4].
   3. Secure it tightly with the bolt [1-25] under the bedknife base arm.

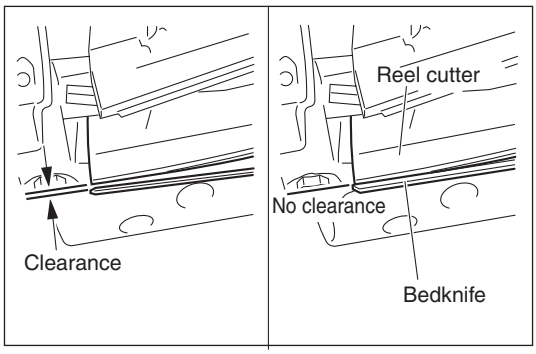
   * Tighten the bedknife base arm so that it becomes parallel to the frame. Take care not to twist arms while tightening.
   4. Tighten the cutter pin [1-20] on both sides.
   (Do not tighten the lock nut.)
   5. Remove the fulcrum seat bolt which has been temporarily secured.
   (Due to the weight of the bedknife base arm, the bedknife touches the reel cutter slightly.)



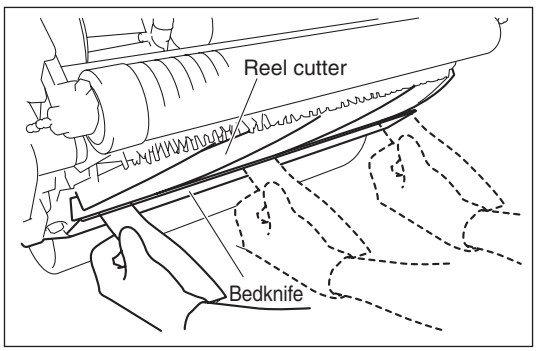




3) Align the punch mark of the cam bush on both sides to the mowing direction.

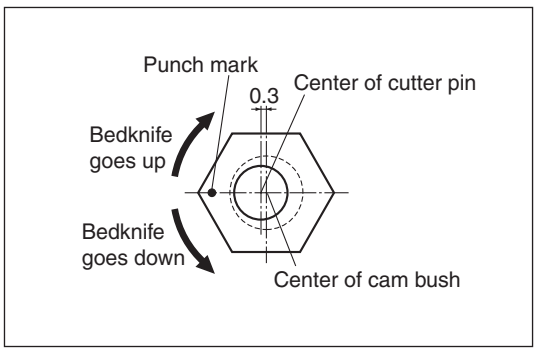


4) Make sure that the reel cutter and bedknife contact.



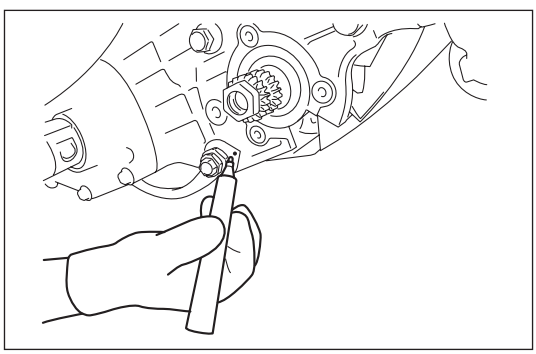
5) Try to cut a strip of newspaper from left to right while gently turning the reel (at 5 to 6 different places)

* If the reel and bedknife are not yet engaged correctly. (Do not turn the reel blade too fast as it is dangerous)

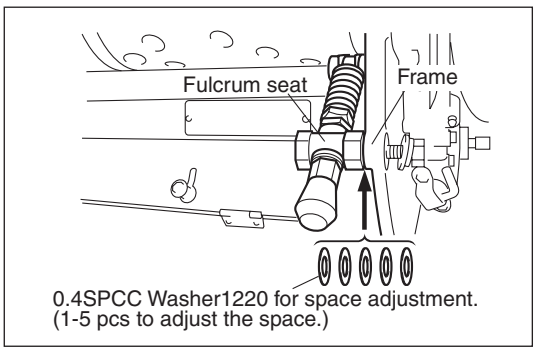


6) Adjust the position of the cam bush [1-22] so that a newspaper is cut smoothly at both ends of the reel.

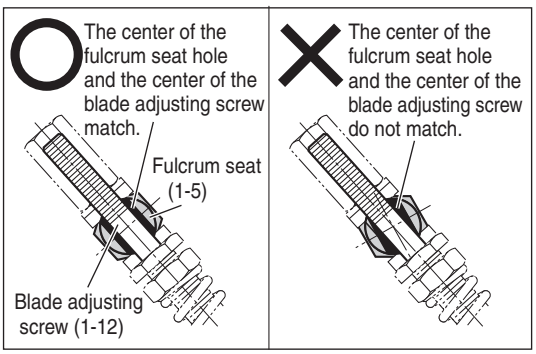
* When cutting a newspaper, insert it vertically to the bedknife. Turn the reel cutter slowly and adjust appropriately so that the newspaper is cut sharply.



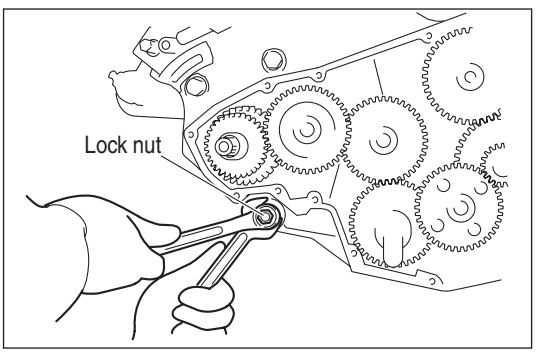
7) Once the position of the cam bush is adjusted, mark the position of the punch mark on the mower with a marker.



8) Tighten the fulcrum seat [1-5] to the right and left frames with the bolt [1-4]. In case there are clearance between the frame and the fulcrum seat, set 1-5 pieces of 0.4SPCC washer 1220 for clearance adjustment to clear the clearance.


The center of the fulcrum seat hole and the center of the blade adjusting screw match.
Fulcrum seat (1-5)
Blade adjusting screw (1-12)
The center of the fulcrum seat hole and the center of the blade adjusting screw do not match.

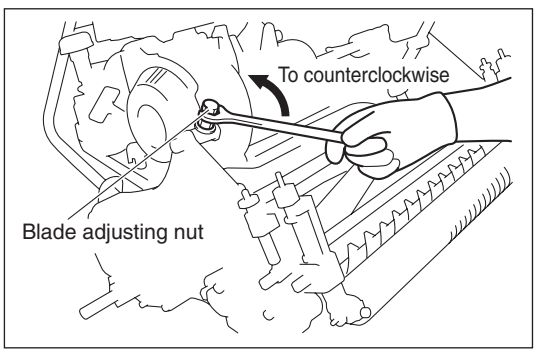
9) Match the center of the fulcrum seat hole and the blade adjusting screw as shown in the left drawing.



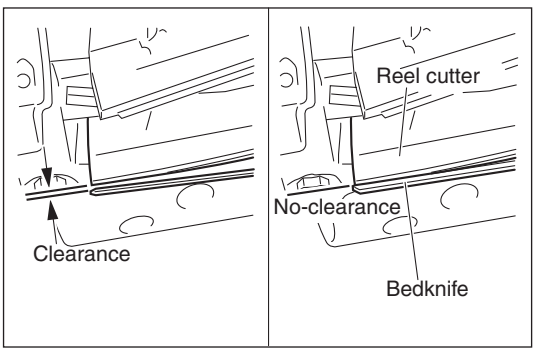
10) Tighten the lock nut [1-21] on the cutter pin on both sides.

* Make sure that the cam bush [1-22] doesn't move from the marked position.

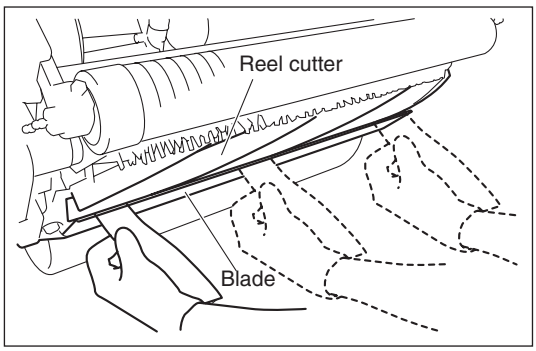
Blade engagement



1) When the blade adjusting nut [1-1] is turned to the "left", the bedknife moves closer to the reel cutter.

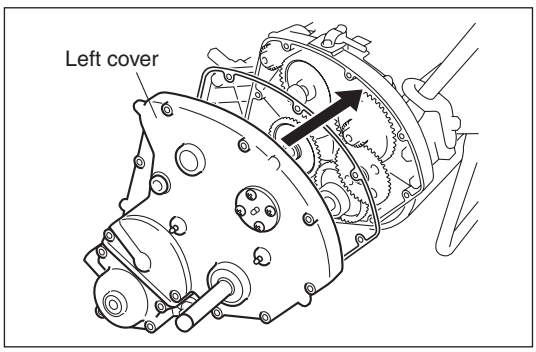


2) Visually inspect the clearance between the edges of the reel cutter and bedknife.
   If there is a clearance, adjust it by turning both blade adjusting nuts uniformly and slowly to the left.
3) When the clearance starts disappearing, turn the reel cutter in the reverse direction and make sure that you hear the contact sound between the reel cutter and bedknife.
   If there is no sound, turn the blade adjusting nut to the left so that you hear the contact sound, and try cutting a strip of newspaper.

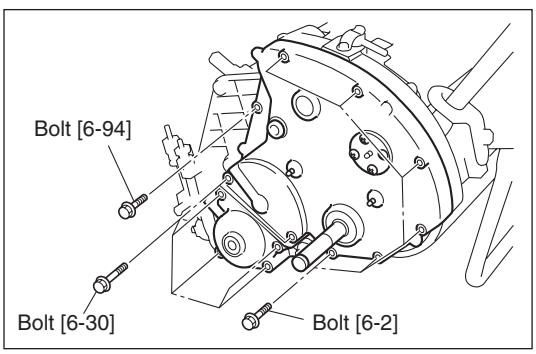


4) To make sure that the newspaper is cut uniformly on both sides of the cutter, loosen the blade adjusting nut on the side where the newspaper is cut better by turning it slightly to “right” and adjust the side that doesn’t cut well by turning the nut slightly to “left”.

* Be careful not to press the cutter and blade to each other too hard.

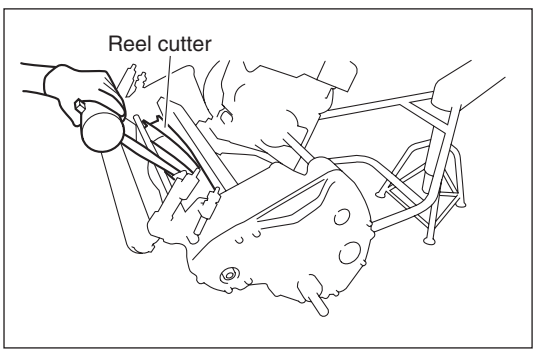


5) Apply grease on the 33-tooth reel gear and 42-tooth reel gear [1-46] , 36-tooth reel gear and 45-tooth reel gear [6-54] and the lip surface of the oil seal on both sides of the cover. Attach the left cover [6-89] as shown in the illustration.

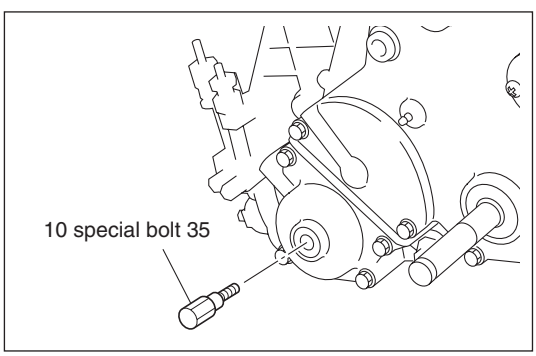


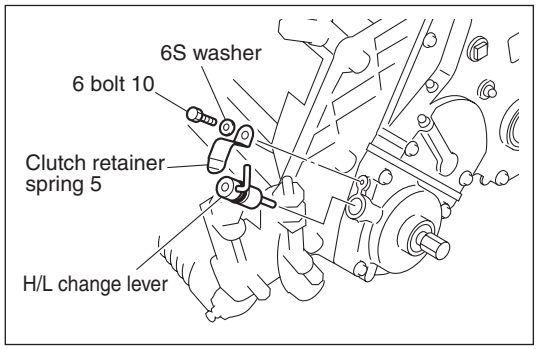
6) Secure the left cover [6-89] with the six bolts [6-2], one bolt [6-94], six bolts [6-30].

* Please tighten the screws uniformly.



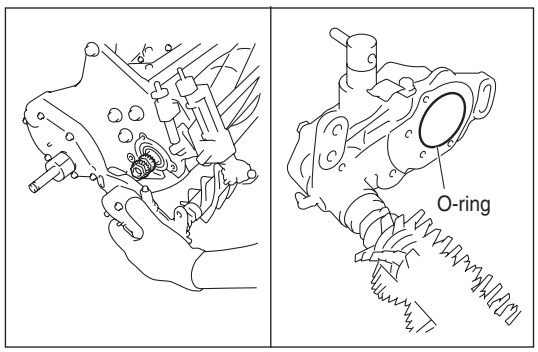
7) Attach the 10 special bolt 35 [1-47].
(Lock the reel by inserting a wooden hammer handle into the reel cutter to prevent the reel from turning.)





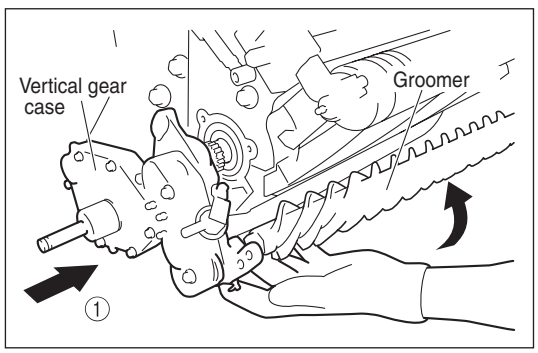
8) Install the H/L change lever [6-91] on the left cover [6-89], attach the clutch retainer spring 5 [6-56], 6S washer, 6 bolt 10.

* Install the alignment finger of H/L change lever in the 33-tooth reel gear and 42-tooth reel gear.

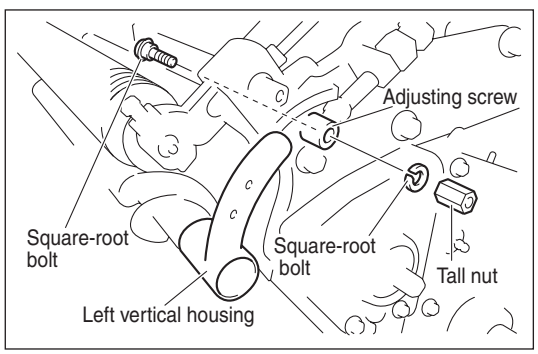


Equipped with the groomer

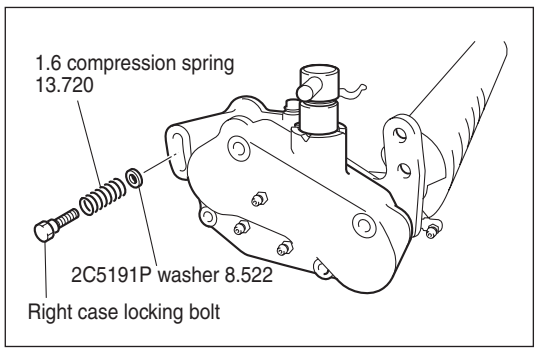
1) Apply the grease (EXCELITE EP No.2) to the 20-tooth reel gear [8-46].
   Apply the grease also to the vertical gear case's O-ring [8-48].
   (Make sure that the O-ring is firmly fitted into the groove.)



2) Fit the vertical gear case over the 20-tooth reel gear [8-46]. (Push the case in the direction of ① as far as possible.)
   On the opposite side, fit the left vertical housing [8-63] into the frame's groove, and raise the groomer.



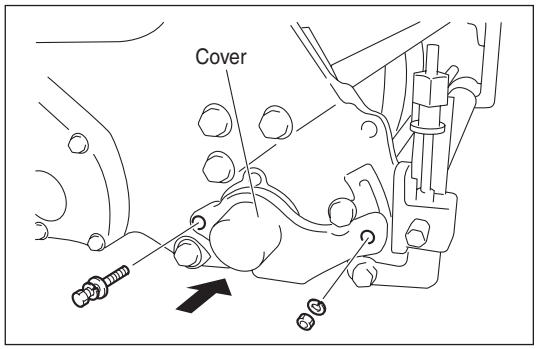
3) Insert the right and left square-root bolts [8-49] along the groove from the inside of the frame.
   Insert the adjusting screw 108 [8-57] and secure it temporarily with the spring washer [8-59] and tall nut [8-58].



4) Attach the right case locking bolt [8-60]. (This bolt is for keeping the case from unfastening, not for locking it down.)

* Be careful not to tighten the bolt too hard.

5) Tighten the tall nut [8-58] on the adjusting screw on both sides.

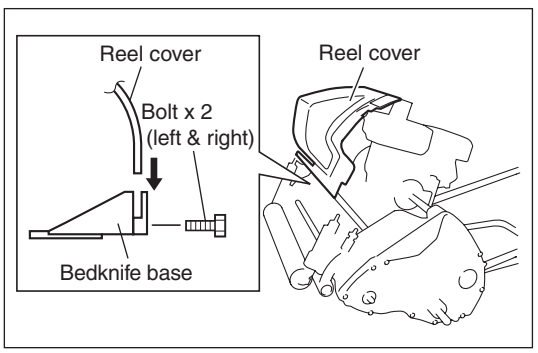


Models not equipped with a groomer

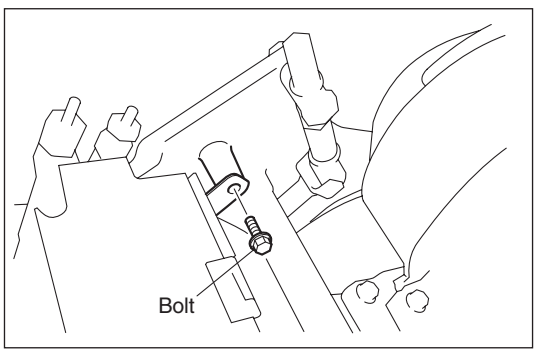
Attach the cover.

* After making sure that the position of the O-ring [1-31] is correct, apply grease to it. Secure it tightly.

[4] Installation of the reel cover

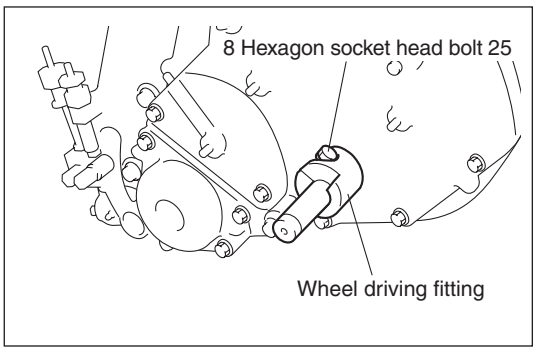


1) Set the reel cover into the groove behind the bedknife base.

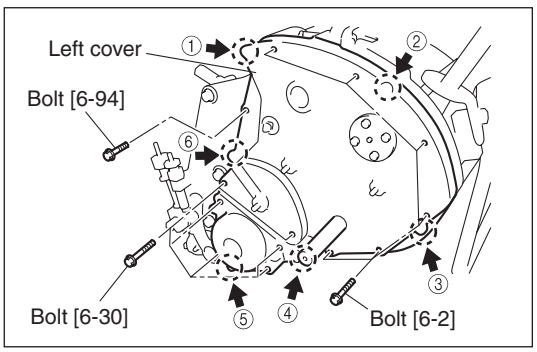


2) Secure it with the two bolts [1-25].

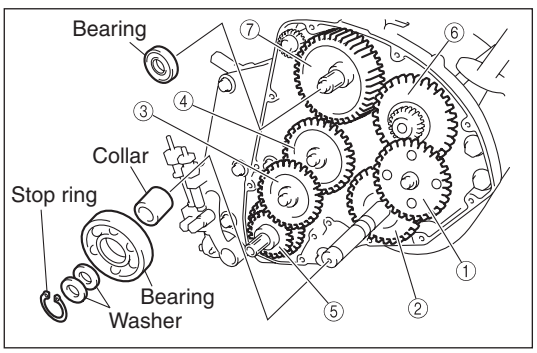
[5] Overhaul of the inside of the gear case (left)



1) Set up the stand and remove the traveling wheels.
   First, loosen the hexagon socket head bolt on the wheel driving fitting, and then remove the fitting.
   Remove the key [4-11] from the outer drum shaft.
   Use an item such as a wooden hammer handle to prevent the reel from turning, and remove the 10 special bolt 35 [1-47], H/L change lever [6-91]. Then, unscrew the six bolts [6-2], six bolts [6-30], one bolt [6-94], and then detach the left cover [6-89]

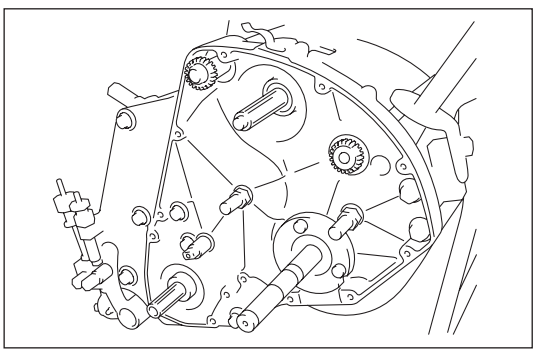


* Do not force open the cover using an object such as a screwdriver as it will scratch the adjoining surfaces.
   If the cover doesn't come off easily, remove it by tapping those six locations (indicated by the arrows in the left illustration) lightly with a wooden hammer.



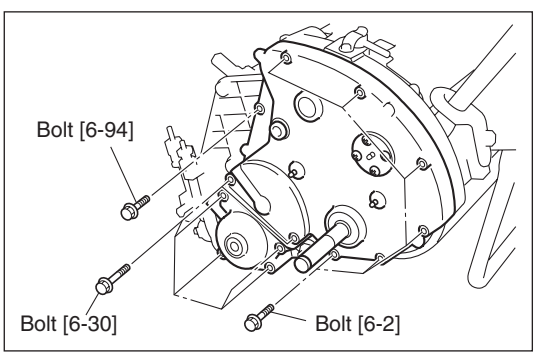
2) Remove the stop ring [6-21], washer [6-22,23], bearing [6-24] and collar [6-25] from the outer drum shaft.

* If you mark the gears with numbers as shown in the illustration using a permanent marker before you remove them, it helps to make the direction and order of the gears clear when assembling them.
   Remove the gears in the order of the numbers shown in the illustration.
   (When removing the #2 gear, be careful not to lose the key.)
   (Remove the changeover clutch lever before the #7 gear.)

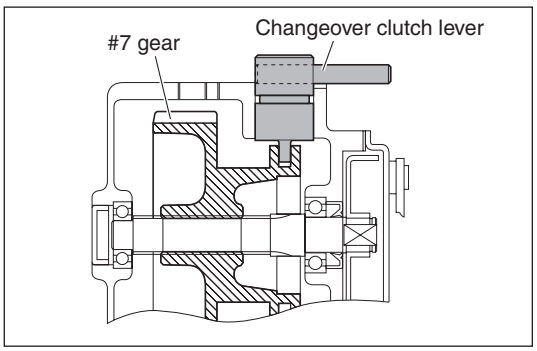


3) Pay attention to the quantity, size, direction, and type when removing the gear, washer, bearing, and needle bearing.

* Check for any crack on the gear or wear on the bearing and shaft, and if necessary, replace them.



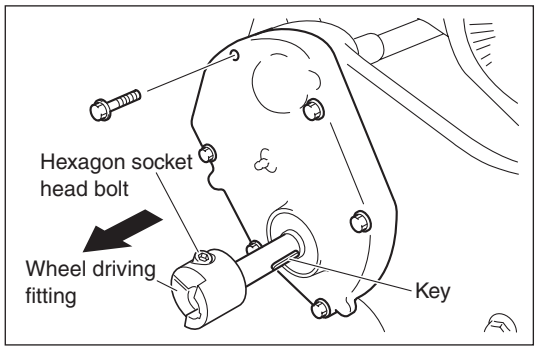
4) Assemble the corresponding parts in the reverse order that they were disassembled.

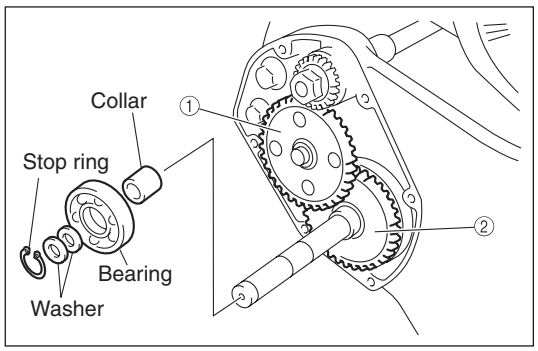


* Make sure that the changeover clutch lever is fitted tightly into the groove of the #7 gear.
  Apply enough grease to the gear tooth surface and bearings when assembling them.

5) Before attaching the cover, verify the gears' movement and the number of the washers. If the cover doesn't fit well, the direction of the gears may be wrong or the gears may not be fitted well.
* Please refer to the Parts Catalog as well.
* Please do not force the cover to fit by hitting on it. Such actions could cause a fracture or dent.
* When tightening the bolts on the cover, first tighten them by hand, and then using a tool, tighten them gradually in a diagonal order (over a couple of rounds).
  After the bolts are tightened, turn the drum by hand to see if it turns smoothly.

[6] Overhaul of the inside of the gear case (right)





1) Set up the stand and remove the traveling wheels.
   First, loosen the hexagon socket head bolt [4-10] on the wheel driving fitting, and then remove the fitting.
   Remove the key [4-11] from the outer drum shaft.
   Unscrew the six bolts [6-2] and remove the right cover [6-3].

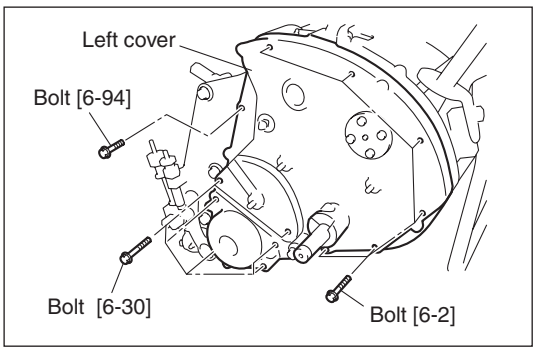
* Use a permanent marker to mark the gears with numbers as shown in the illustration before you remove them. This helps clarify the direction and order of the gears when reassembling them.

2) Remove the stop ring [6-21], washer [6-22,23], bearing [6-24], and collar [6-25] from the outer drum shaft.
   Remove the gears in the order of the numbers shown in the illustration.
   (When removing the #2 gear, be careful not to lose the key.)
   Pay attention to the quantity, size, direction, and type when removing the gear, washer, bearing, and needle bearing.
   Check for any crack on the gear or wear on the bearing and shaft, and if necessary, replace them.

3) Assemble the corresponding parts in the reverse order that they were disassembled.

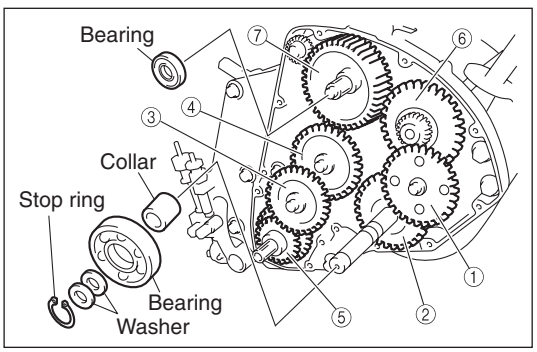
* When assembling them, apply enough grease to the gear tooth surface and bearings.

[7] Removing / installing the drum assembly

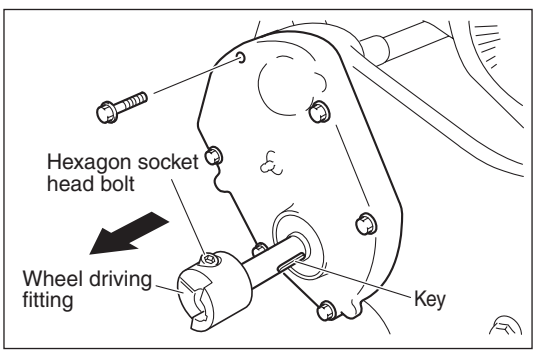


1) Set up the stand and remove the traveling wheels.
   Remove the left cover [6-89].

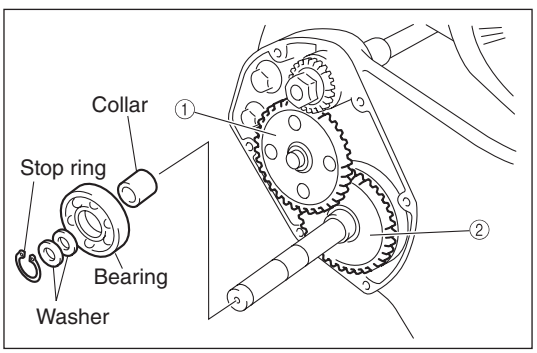
* For more information, refer to sections " [5] Overhaul of the inside of the gear case (left)" or " [6] Overhaul of the inside of the gear case (right)".



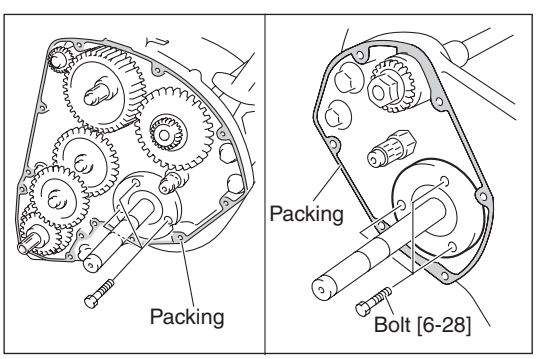
2) Remove the #1 and #2 gears.



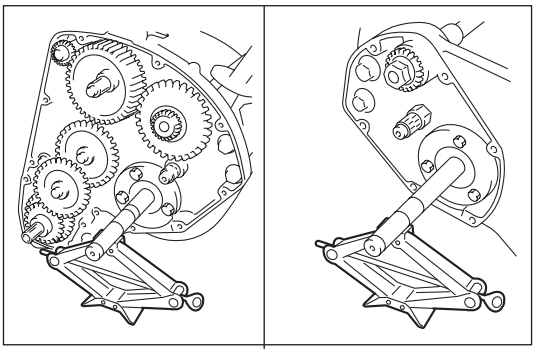
3) Remove the right cover [6-3].



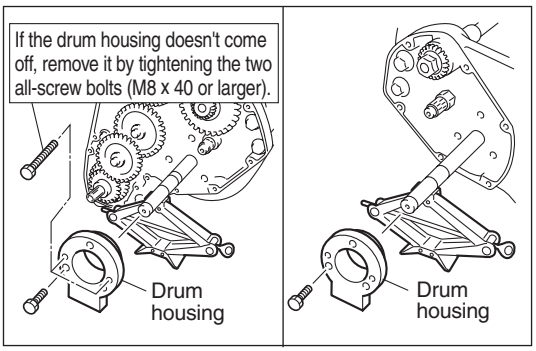
4) Remove the #1 and #2 gears.



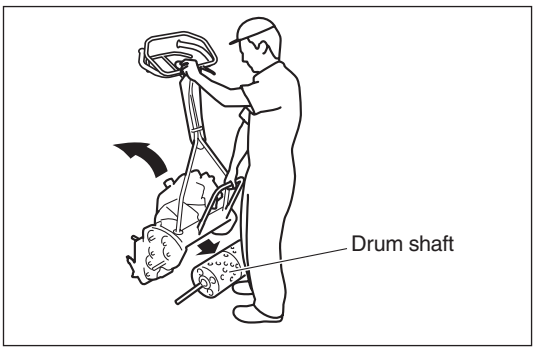
5) Remove both the right and left packings.
   (Be careful not to break the packings when removing them. If they ever break, exchange them with the new ones.)
   Unscrew the three bolts [6-28] from both the right and left drum housings.



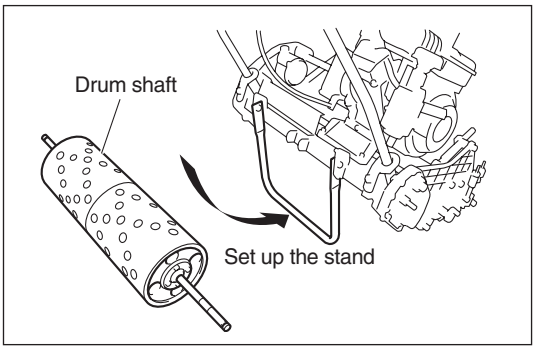
6) Gently hold both ends of the drum shaft with pantograph jacks.
(If no pantograph jack is available, use an alternative and make sure that the drum shaft doesn't come down.)


If the drum housing doesn't come off, remove it by tightening the two all-screw bolts (M8 x 40 or larger).
Drum housing
Drum housing

7) Remove the right and left drum housings [6-29] outward.
* If they don't come off, remove them by tightening all-screw bolts (M8 x 40 or larger) into the two female screws.
After both drum housings come off, remove the right and left jacks, and take the drum Ass'y down.

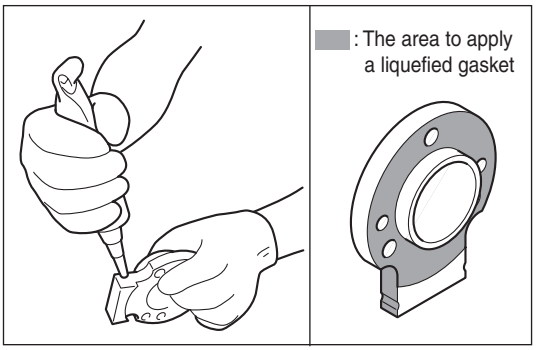


8) Lift up the handle and stand, and move the mower forward.
* After moving the mower, set up the stand.

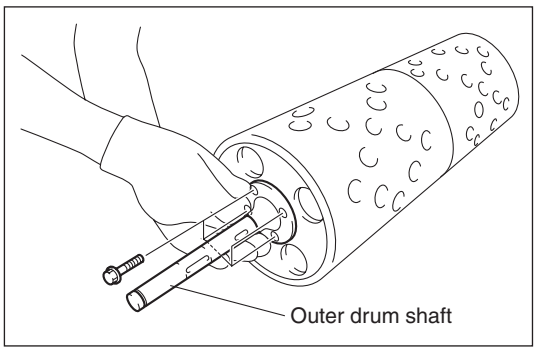


9) Assemble the corresponding parts in the reverse order that they were disassembled.
* When assembling them, apply enough grease to the gear tooth surface and bearings.
When installing the drum housing, apply a silicon gasket to the locations that touch the frame.
1. Clean up the old gasket and any dirt attached to the frame. (Remove grease.)
2. Apply a liquefied gasket to the packing's surface facing the frame (be careful not to use too much grease), and attach the packing to the frame.

* Replace the packings as needed.

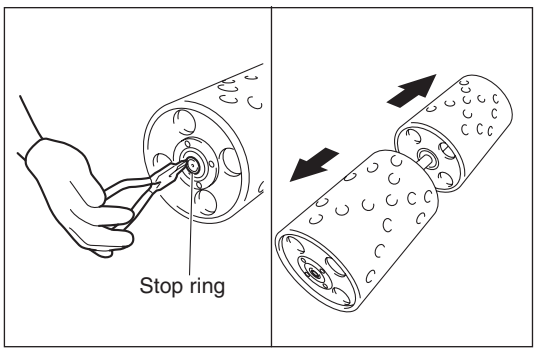


[8] Disassembling / assembling the drum



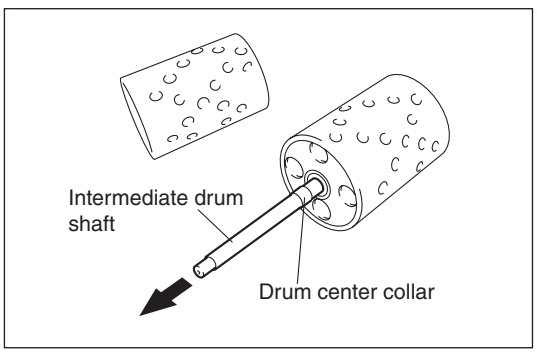
1) Remove the outer drum shaft [4-15] by unscrewing the four bolts [4-16] on each side.

* Secure the drum so that it doesn't turn when loosening the bolts.



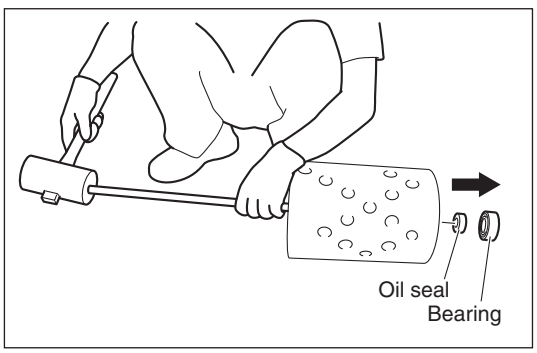
2) Remove the stop rings [4-17] on both sides.
Separate the right from the left drum, and remove one of them.

* If an adjustment shim is used, be careful not to lose it.



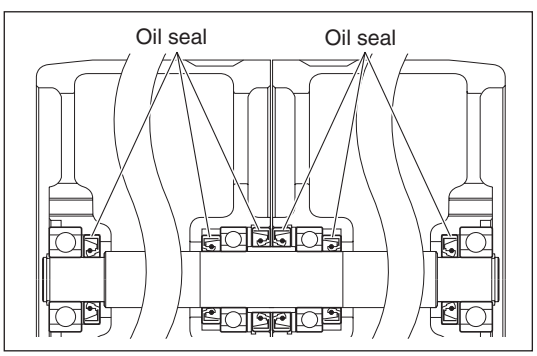
3) Pull out the intermediate drum shaft [4-24,34,40].

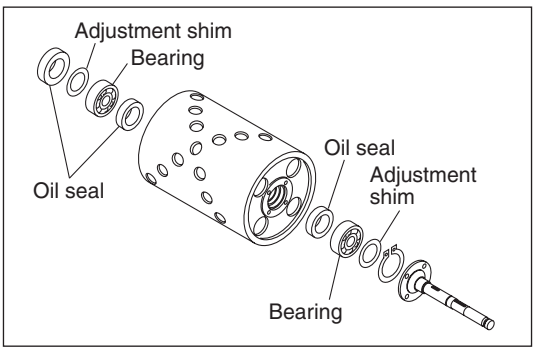
* Be careful not to lose the drum center collar.



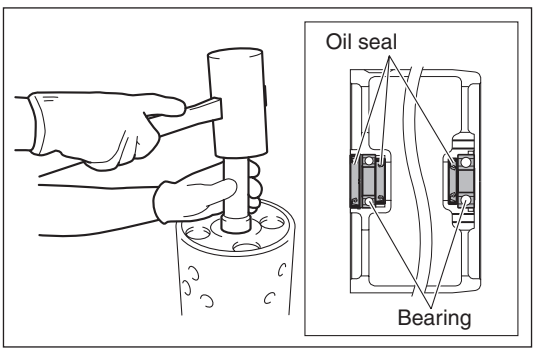
4) Tap inside the drum using something like a round bar, and remove the oil seal and bearing .

* If an adjustment shim is used, be careful not to lose it.

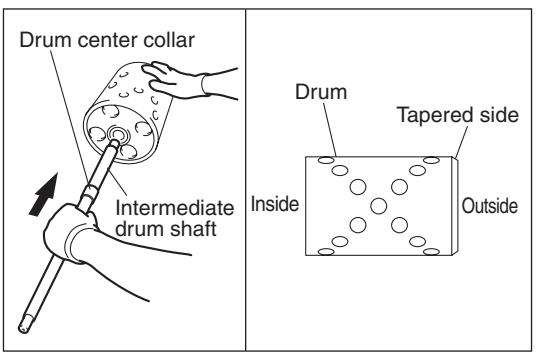




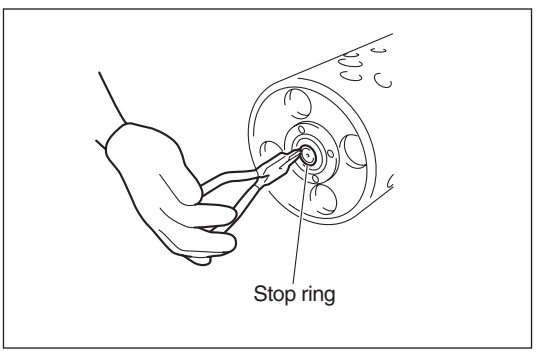
5) Have a new bearing and oil seal available, and apply grease to the lip surface of the oil seal.



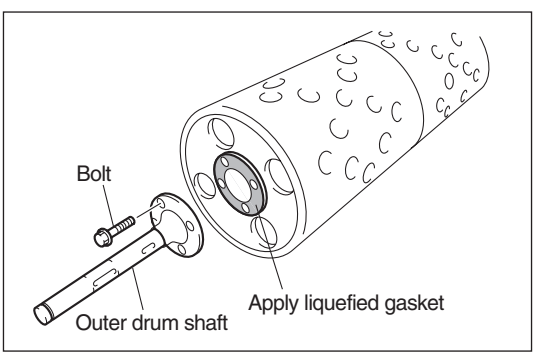
6) Pay attention to the direction of the oil seal and bearing.
Hammer them parallel to the drum. (Hammer the bearing and oil seal all the way inside.)



7) Insert the intermediate drum shaft [4-24,34,40] from inside.
(Do not forget to insert the drum center collar.)

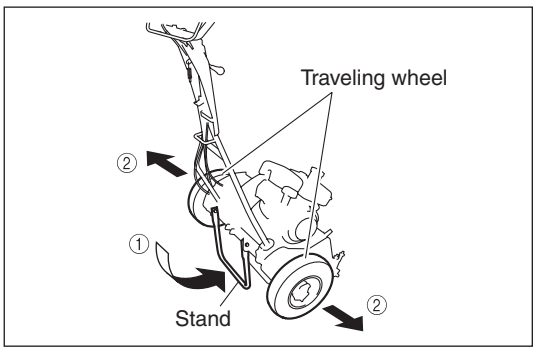


8) Place the stop ring [4-17] on both sides.
* If an adjustment shim was used, do not forget to replace it.

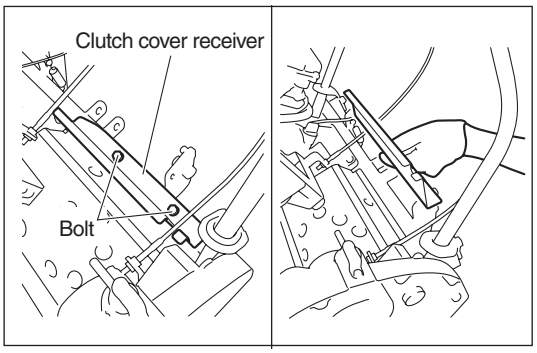


9) Secure the outer drum shaft with four bolts.
(Also, apply a liquefied gasket to the shaded area shown in the illustration.)

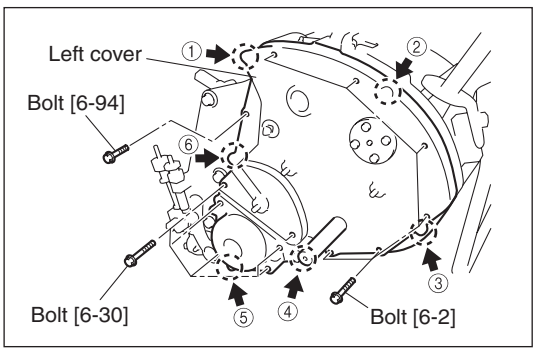
[9] Removing / installing / disassembling / assembling the transmission shaft



1) Set up the stand first, and then remove the traveling wheels on both sides.

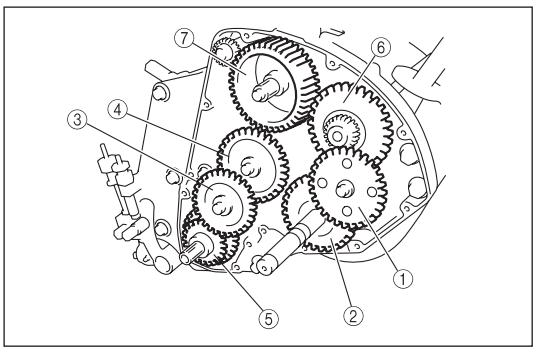


2) Open the clutch cover and remove the clutch cover receiver [5-43,44,53].
(Remove the two bolts.)

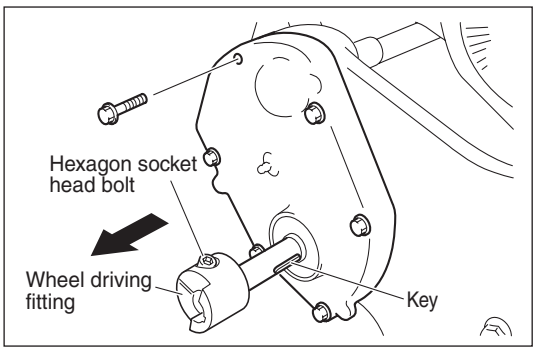


3) Remove the six bolts [6-2], six bolts [6-30], one bolt [6-94], and remove the left cover [6-89].

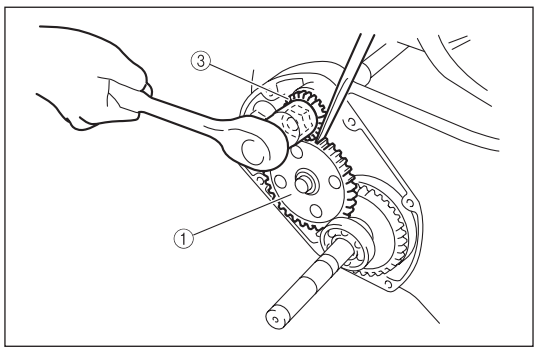
* Refer to Section " [5] Overhaul of the inside of the gear case (left)."



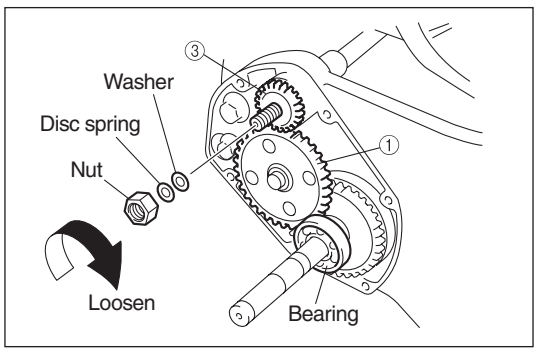
4) Remove the #1 gear [6-19].
Remove the #6 gear [6-67].



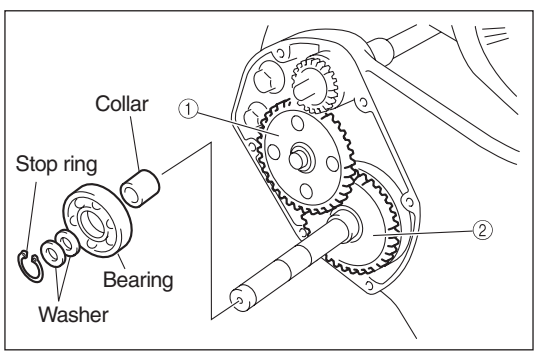
5) Remove the right cover [6-3]. (Remove the six bolts.)



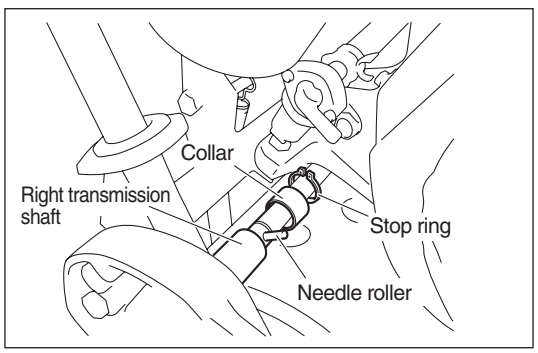
6) Remove the nut [6-6] from the #3 gear. (left-hand threaded)
Loosen the nut while holding the #1 gear with a flat-head screwdriver to keep the #3 gear from turning. (Hold the flathead screwdriver vertical to the teeth of the #1 gear.)



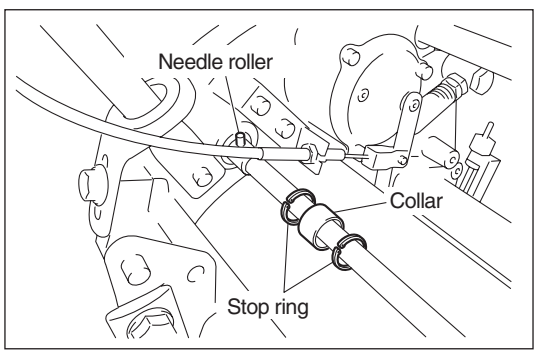
7) Remove the #3 gear by turning it clockwise.
* They are left-hand threaded.



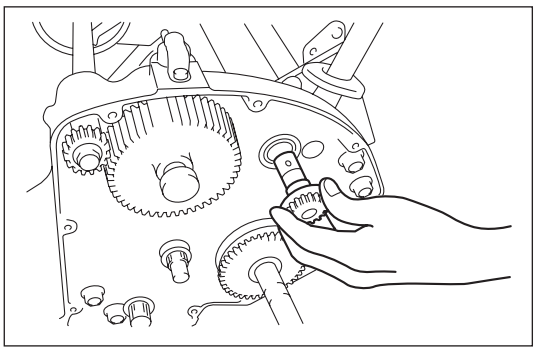
Remove the #1 gear.



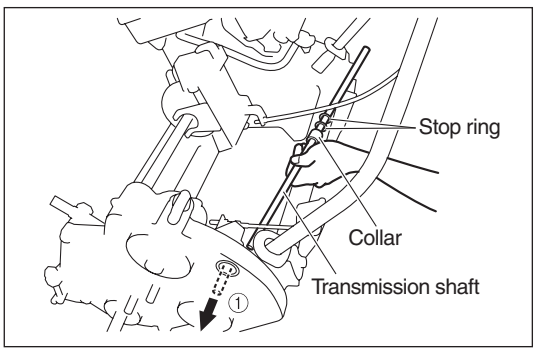
8) Keep the right transmission shaft [6-13] from turning by using something like pliers, and remove the #3 gear by turning it clockwise.
Remove the stop ring [6-34] on the right side first. Move the differential joint shaft collar [6-33] slightly and remove the needle roller [6-35].



9) Remove the stop ring [6-34] on the left side, and then slightly move the differential joint shaft collar [6-33].
Pull out the needle roller [6-35], and then remove the stop ring [6-34].

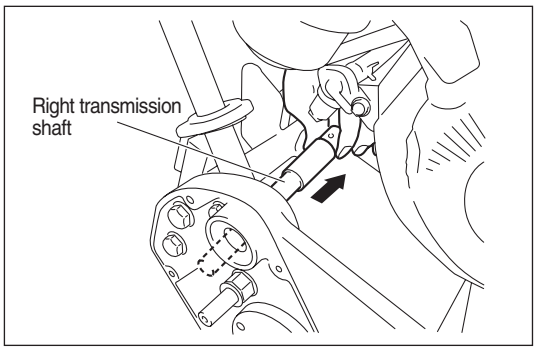


10) Remove the 16-tooth right differential gear [6-66].



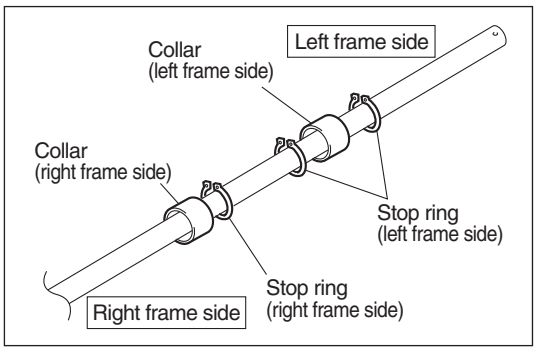
11) First pull out the transmission shaft [6-36,80,101] in the direction of ① (as shown in the illustration).

* Be careful not to lose the collar [6-33] or stop ring [6-34] that are attached to the transmission shaft.



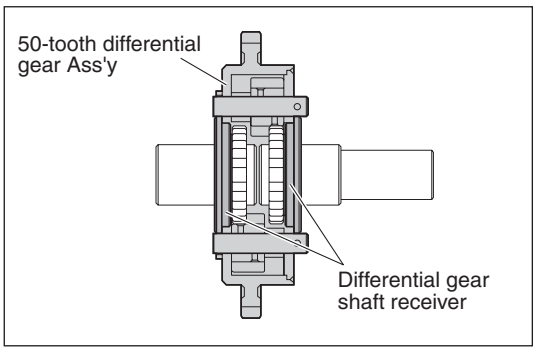
12) Pull out the right transmission shaft.
(If you can't pull it out by hand, remove it by tapping it lightly with a wooden hammer.)

* Check for any wear and damage on the oil seal, bearing, and shaft, and if necessary, replace them.
When replacing them, pay attention to their direction and order.

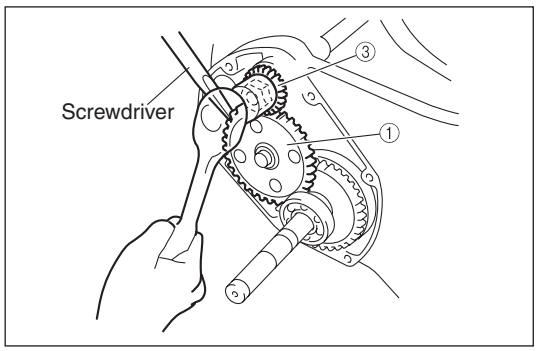


13) Assemble the corresponding parts in the reverse order that they were disassembled.

* Pre-install the three stop rings [6-34] and two collars [6-33] on the transmission shaft [6-36,80,101] as shown in the illustration.



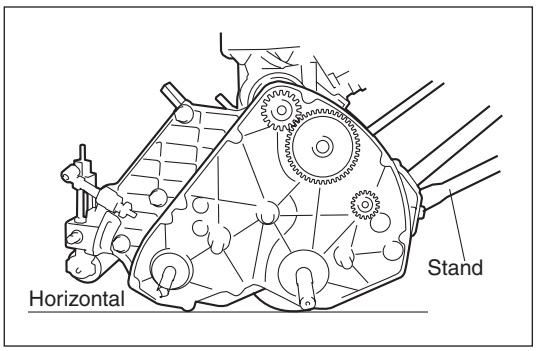
14) Make sure that the 50-tooth differential gear Ass'y [6-67] and the differential gear shaft receiver [6-65] fit together without any gap.



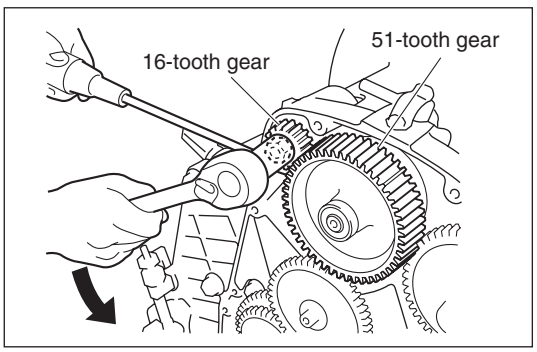
15) Tighten the gear by turning it all the way to the left, and then turn it back to the right a quarter of a circle. (left-hand threaded)
Then, secure it with the lock nut [6-6].

* To avoid overstretching the transmission shaft, loosen it slightly.

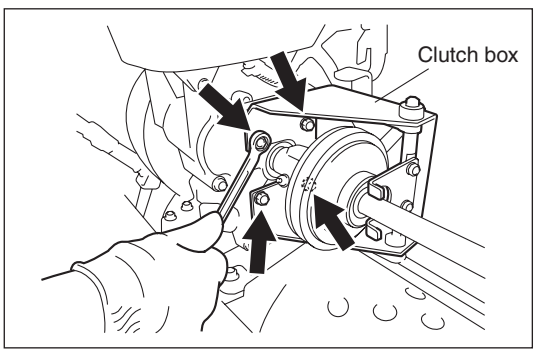
[10] Disassembling / assembling / adjusting the engine clutch area



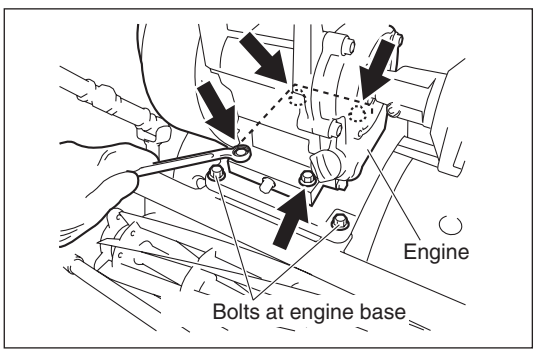
1) Fold the stand and let the drum touch the ground.



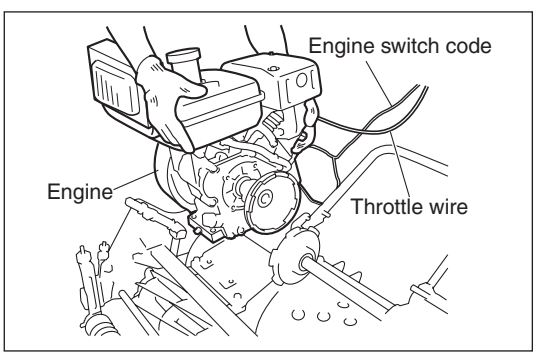
2) Set the changeover clutch lever to “Reel ON” position.
Hold a flathead screwdriver against the 51-tooth gear [6-85] to keep it from turning, and then remove the nut from the 16-tooth [5-39].
Remove the disc spring washer and detach the 16-tooth gear [5-39] and 1 shaft collar [5-38].



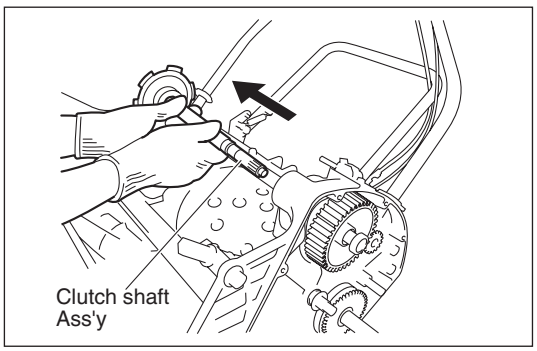
3) Unscrew the four bolts [5-18] and remove the clutch box [5-16].



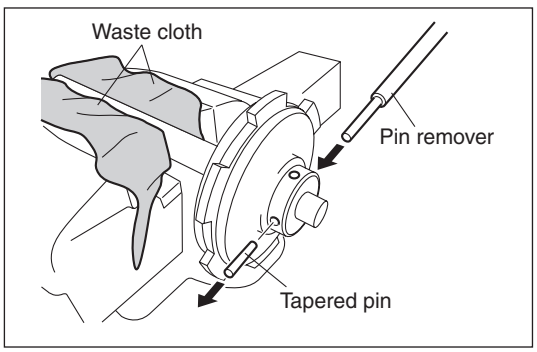
4) Remove the four bolts [7-1] from the engine.
* Do not remove the four bolts [7-4] from the engine base.



5) Remove the engine.
* Be careful with the throttle wire and the engine stop cord that are still attached to the engine.



6) Pull out the clutch shaft Ass'y.

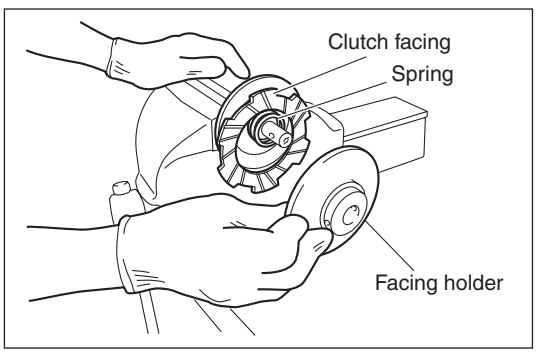


7) Secure the clutch shaft Ass'y [5-24,25,51] on a vice. Pull out the tapered pin [5-27] using a pin remover.

* When securing the clutch shaft Ass'y on a vice, wrap it with a waste cloth to avoid scratching the surface.

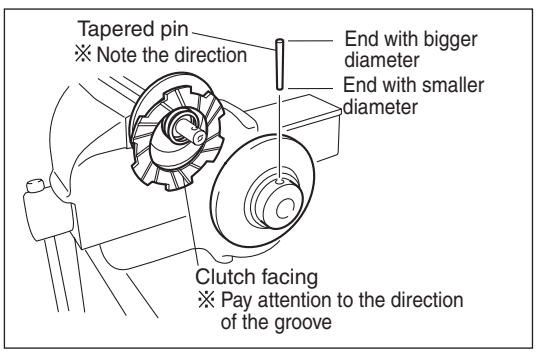
* Since the pin is tapered, remove it by tapping on the thinner end.

* When reassembling it, pay attention to the direction of the pin.



8) First, remove the facing holder [5-26], and then remove the spring [5-30] and clutch facing [5-31].

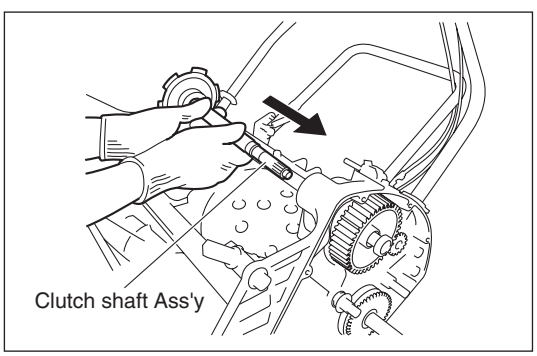
* When replacing the facing, make sure the direction is correct.


Tapered pin
※ Note the direction
End with bigger diameter
End with smaller diameter
Clutch facing
※ Pay attention to the direction of the groove

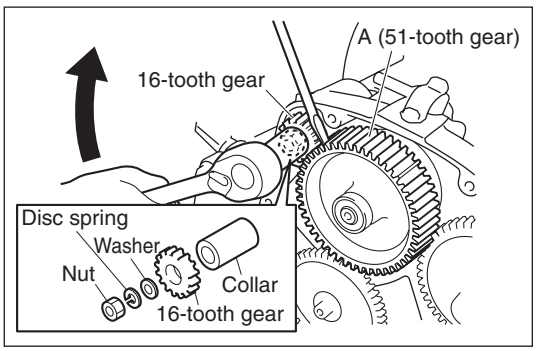
9) Assemble the corresponding parts in the reverse order that they were disassembled. (up to assembly of the engine)

* Make sure to insert the tapered pin in the right direction.

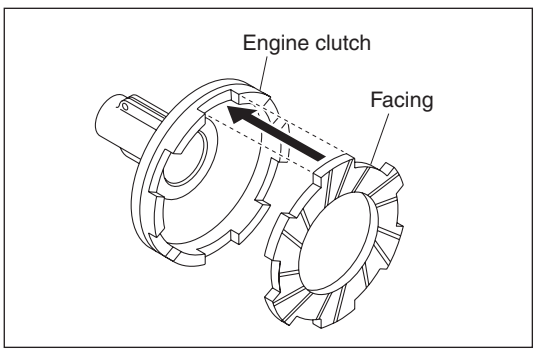
When inserting the pin, the end with a smaller diameter goes in first. (The hole is tapered as well.)



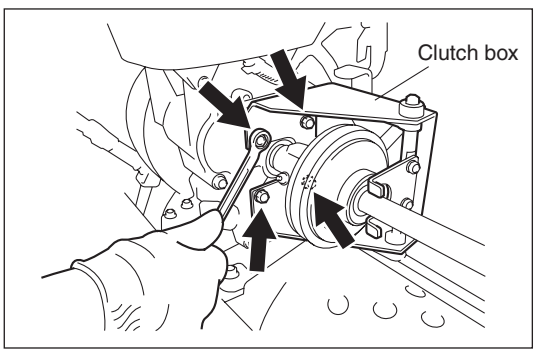
10) Install the clutch shaft Ass'y [5-24,25,51] to the left frame.



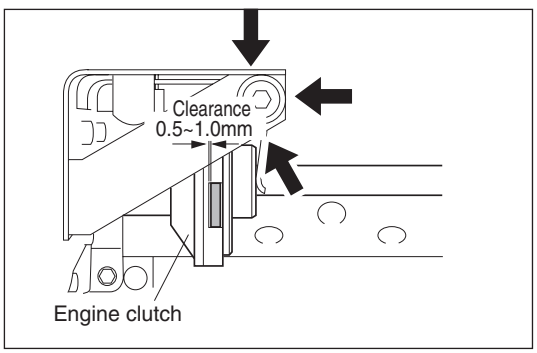
11) Install in the following order: the collar [5-38], gear [5-39], washer [5-40], disc spring washer [5-41], and nut [5-42].
When tightening the nut, hold a flathead screwdriver against the gear A (51-tooth gear) to keep it from turning.



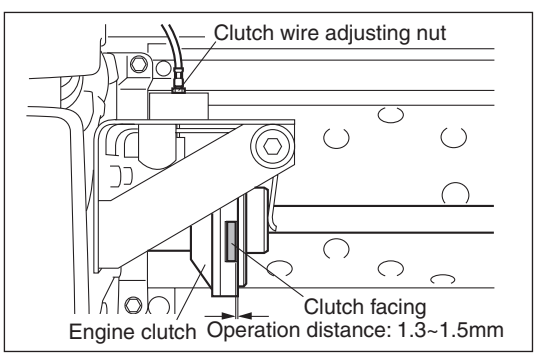
12) When installing the engine, fit the facing in the groove of the engine clutch, and secure the engine temporarily with the four bolts [7-1].
* Of the four bolts, tighten the two which are on a diagonal line until the spring washer levels out.



13) Secure the clutch box [5-16] with the four bolts [5-18].
* Set the main clutch lever of the handle to “ON” position.

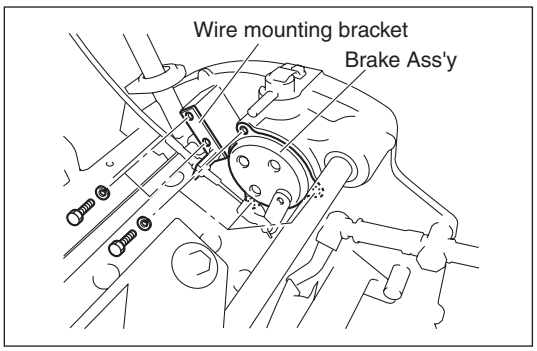


14) Using the 0.5mm (0.020 in.) thickness gauge (included with this product), adjust the clearance (at 6 locations) between the engine clutch and the clutch facing to 0.5 - 1.00mm (0.20 – 0.40in.) by hammering lightly with a tool such as a plastic hammer (in the direction of the arrows as shown in the illustration).
* Once the gap is adjusted to be parallel, securely tighten the four bolts on the engine.
Move the main clutch lever and check for movement and clearance.

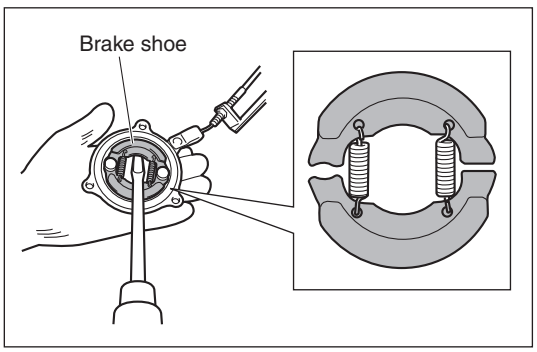


15) Shift the main clutch to ON and OFF repeatedly, and adjust the clutch wire adjusting nut so that the operation distance is 1.30 - 1.50mm (0.52 – 0.60in.).
Make sure the main clutch successfully turns off when shifted to OFF.

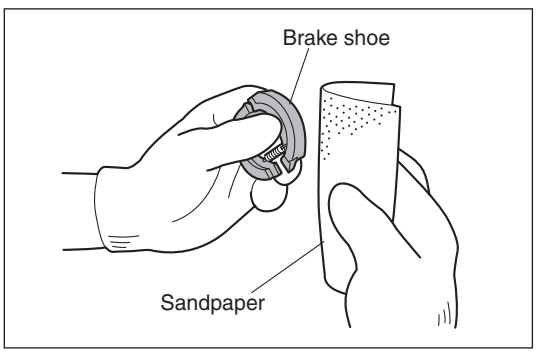
[11] Disassembling / assembling / adjusting the brake



1) Remove the two bolts [7-53] from the wire mounting bracket.
   Remove the three bolts [7-53] from the brake Ass'y.

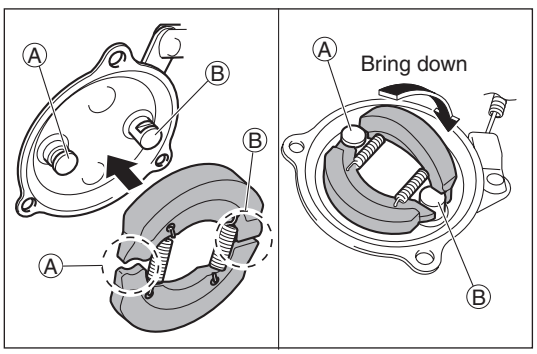


2) Remove the brake shoe using a flathead screwdriver.



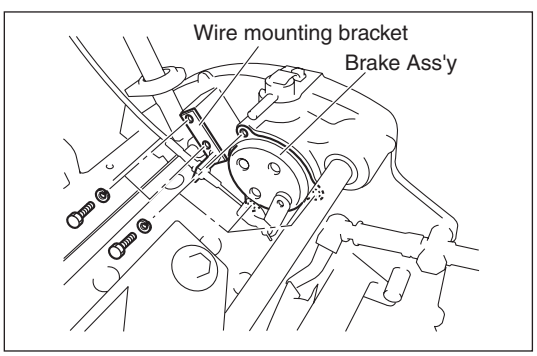
3) With a rougher-grained sandpaper, polish the side of the brake shoe that is touching the drum.
   With a brake cleaner, remove grease from the polished surface and the drum surface.

* When necessary, replace the brake shoe and packing with new ones.

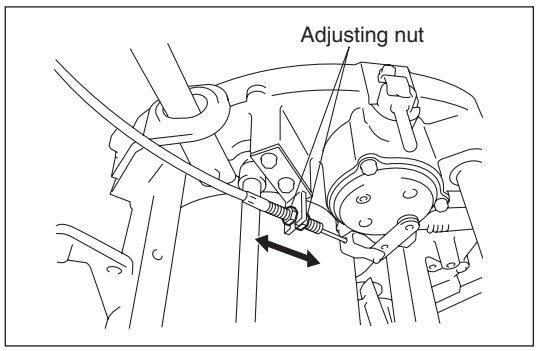


4) First, set the brake shoe as shown in the right illustration of step #2.
   Make sure that the lever position is correct.
   Install the A side of the brake shoe to A and the B side to B.
   When installing the brake shoe, hook one side to A and B and snap in the other with a pop.

* Verify if the shoe is firmly fitted or not.



5) Temporarily tighten the three bolts [7-53].
   Press the lever with a finger a few times to make the brake shoe come to the center of the brake drum, and then firmly tighten the three bolts [7-53].
   Install the wire mounting bracket [7-52].

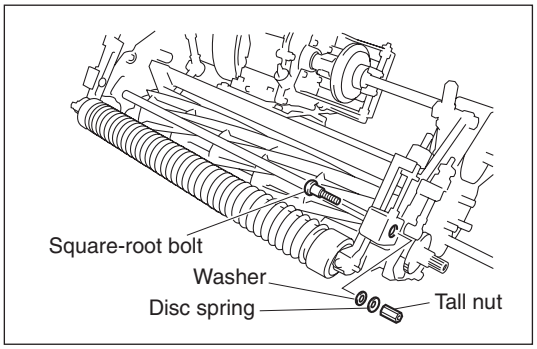


6) Make sure the brake works by gripping the brake lever. (If the brake doesn't work, adjust it by tightening the adjusting nut of the brake wire.)

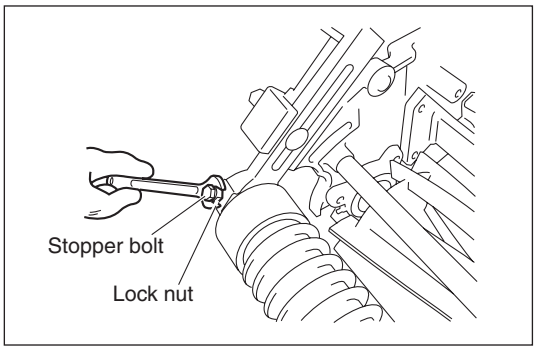
* Set the brake shoe so that it does not always touch the brake drum. (Avoid the brake always being engaged.) The brake may be engaged if, when rotating the drum wheel, you hear a rubbing sound or the drum feels heavy.

[12] Disassembling / assembling the front roller (with a groomer)

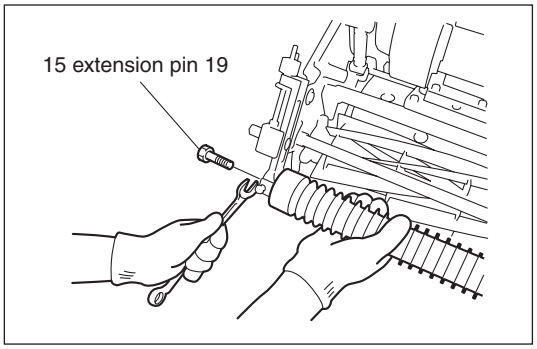
(As for the "with smooth front roller" and "with independent arm" types, follow the same steps)



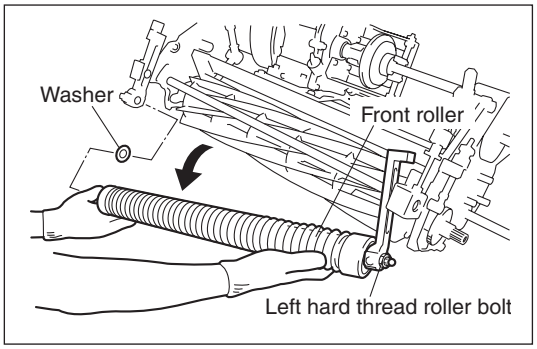
1) Remove the tall nut [2-1], disc spring washer [2-2], washer [2-3], and square-root bolt [2-7] from the left roller bracket on the left frame.



2) First loosen the lock nut [2-26] on the right bracket and then the stopper bolt [2-25].

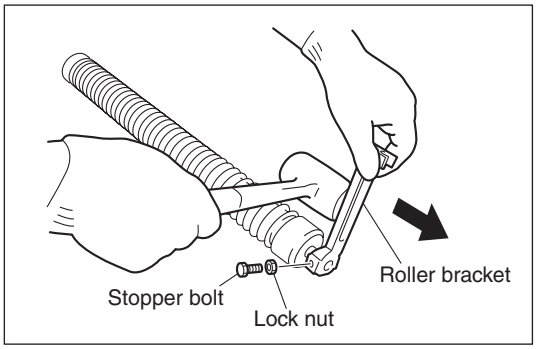


3) Remove the 15 extension pin 19 [2-5] while supporting the front roller [2-9,10].

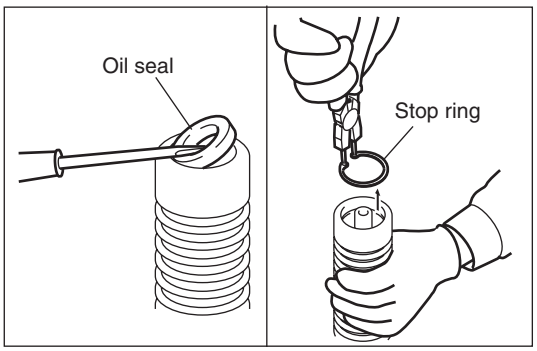


4) Remove the front roller [2-9,10] from the main unit.
Do not lose the washer between the front roller and bracket.

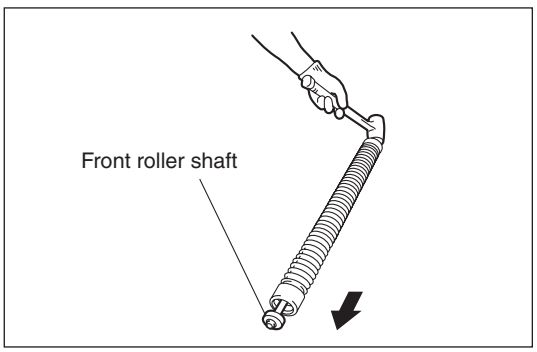
5) Remove left hard thread roller bolt.
(Part # K0071000152)



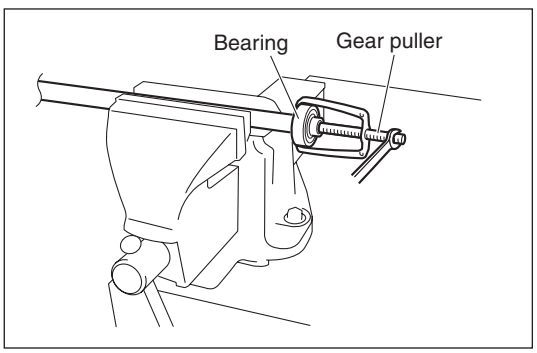
6) First loosen the lock nut [2-26] and stopper bolt [2-25], and remove the roller bracket [2-24] on the left frame by tapping it with a wooden hammer.



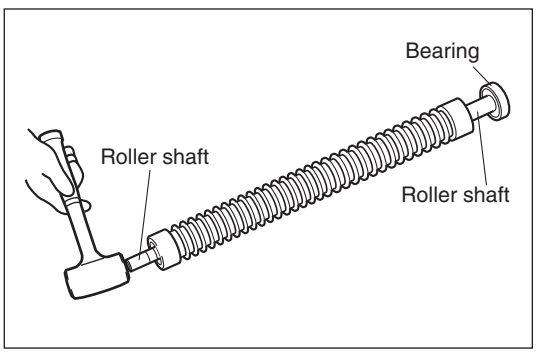
7) Remove the oil seal [2-12] on both sides using a flat-head screwdriver.
Remove the stop ring [2-13].



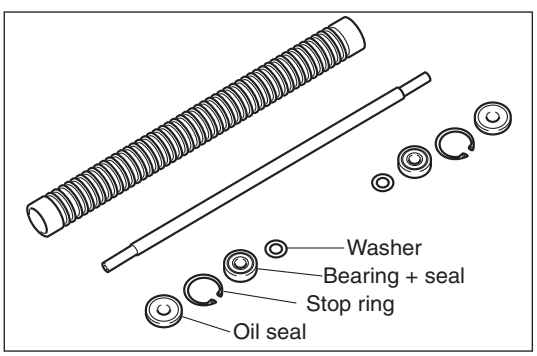
8) Remove the front roller shaft by tapping the end which is sticking out more.

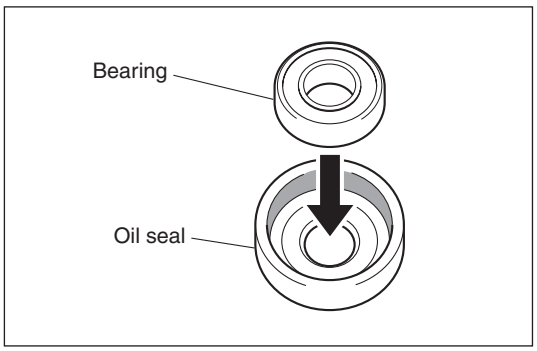


9) Secure the removed front roller shaft on a vice, and remove the bearing [2-14,15] from the shaft using a pulley remover.



10) Remove the bearing on the opposite side by tapping the removed roller shaft into it.

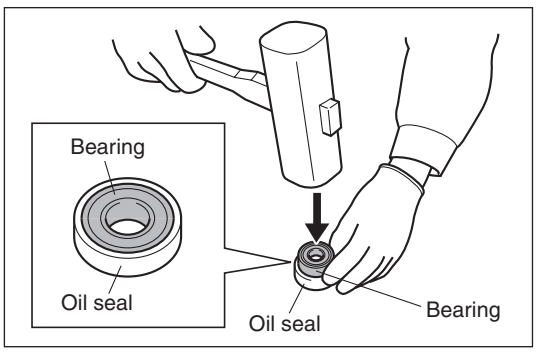


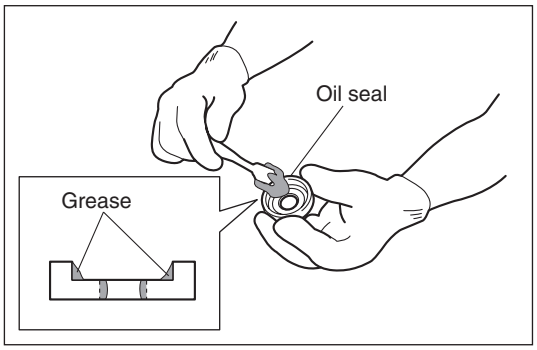


Preparation of replacement parts

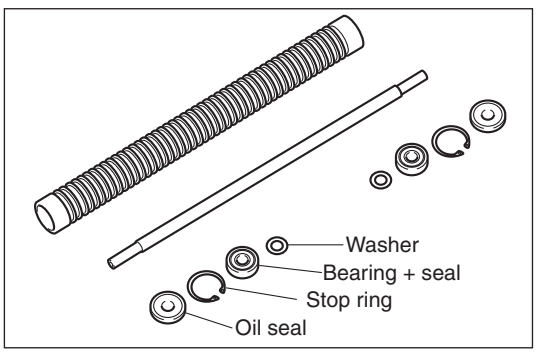
Have the replacement parts ready beforehand.

1) Apply some grease inside the oil seal [2-14]. Insert the bearing [2-15] into the oil seal firmly by tapping it with a wooden hammer.



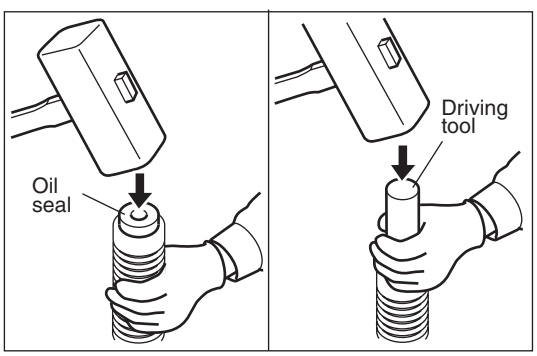


2) Apply grease to the lip surface of the oil seal [2-12] which is to be set on the outside of the roller. (The lip surface is inside the oil seal as shown in the illustration.)

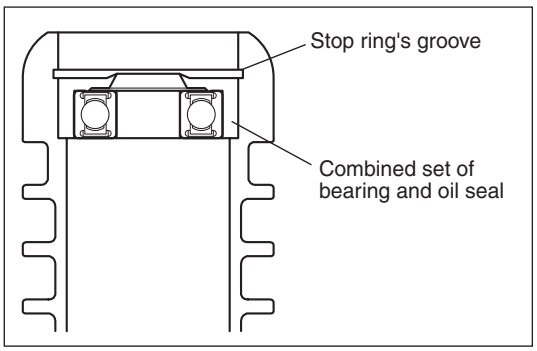


Have a stop ring [2-13] and washer [2-16] available.

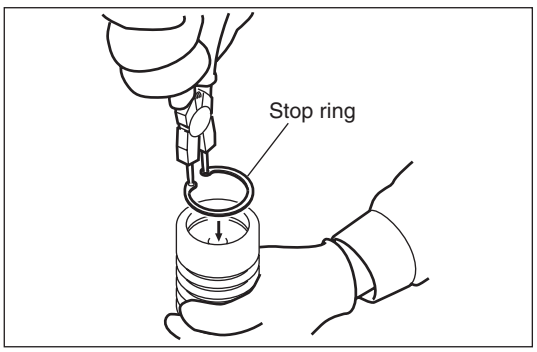
* Inspect each part (such as the roller shaft), and replace them when needed.



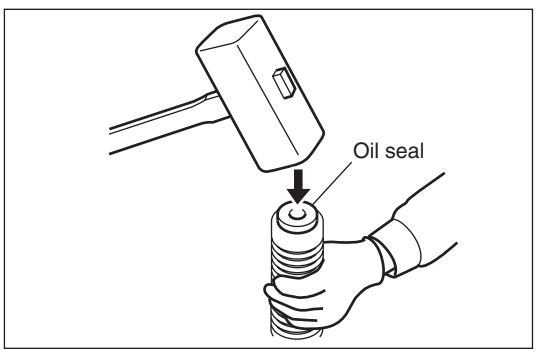
3) Pound in the combined set of the bearing [2-15] and oil seal [2-14] on one side of the roller.
(The oil seal side should face upward.)



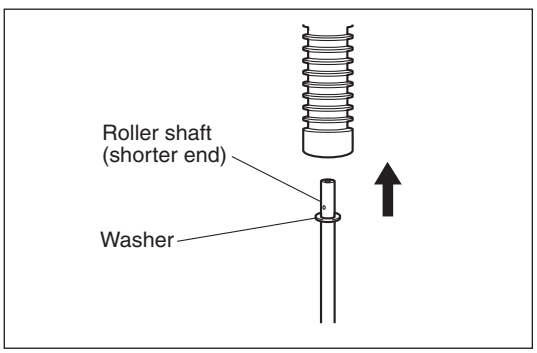
Using a driving tool, pound in the bearing and oil seal set all the way.
(Drive them in below the stop ring's groove.)



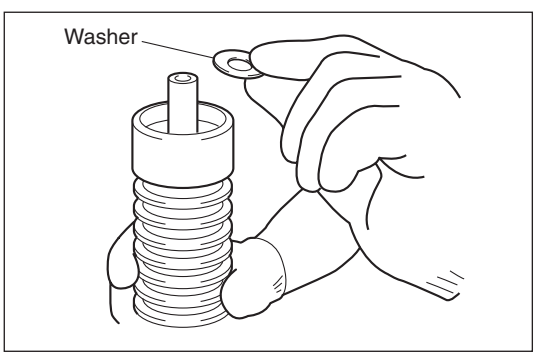
4) Insert the stop ring [2-13].



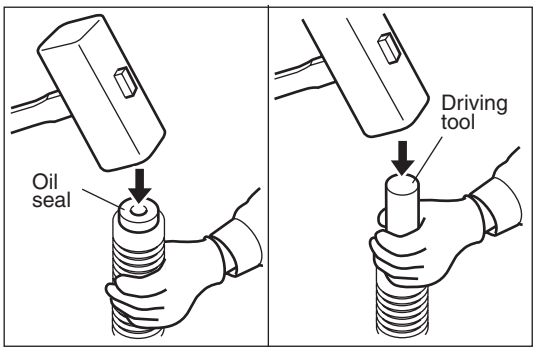
5) Pound in the oil seal [2-12] on the outside. (up to the edge of the roller)

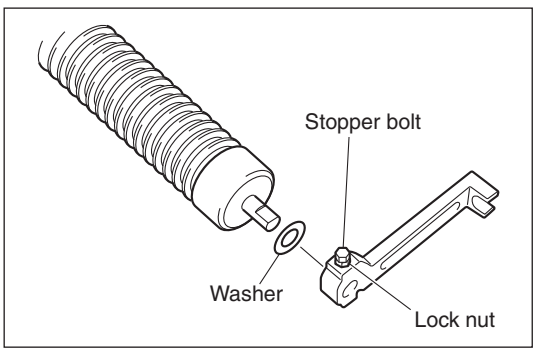


6) Insert the washer from the end of the roller shaft that has a shorter stepped section.
Insert the shaft from the end of the roller with no bearing.
Place the roller shaft firmly into the bearing.

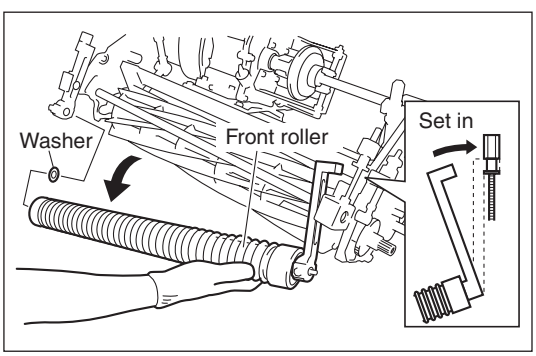


7) After the shaft is inserted, turn the roller upside down and insert the washer [2-16] from the other end of the shaft.
Additionally, using a driving tool, hammer in the bearing [2-15] and oil seal [2-14] set, stop ring [2-13], and oil seal [2-12], in this order .

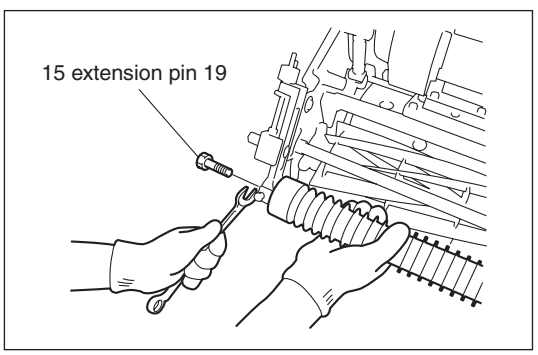




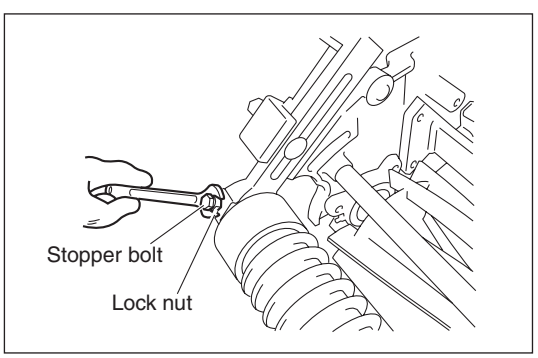
8) Install the washer [2-8] and bracket [2-24] as shown in the illustration.
Set and secure the flat end of the roller shaft into the stopper bolt side, and lock it.



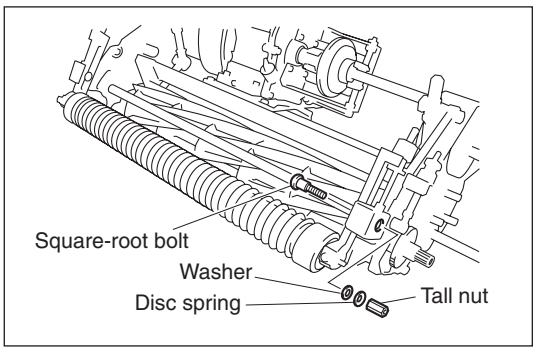
9) As shown in the illustration, match the bracket to the frame's joint, and set the top of the bracket in the groove of the roller adjuster [2-21].



10) Insert the washer [2-8] between the roller and bracket [2-23], and install them with the 15 extension pin19.
(Make sure that the extension pin does not cut into the washer.)

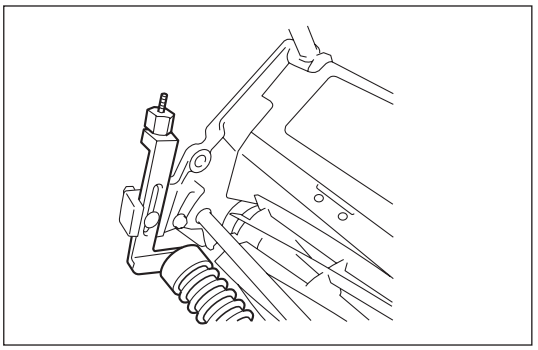


11) Tighten the bracket's stopper bolt [2-25] and secure it with the lock nut [2-26].

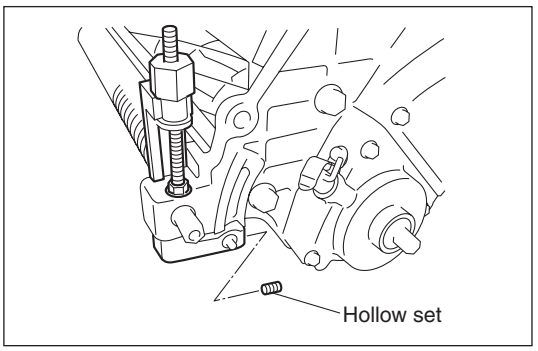


12) Secure the roller with the tall nut [2-1], disc spring washer [2-2], washer [2-3], and square-root bolt [2-7] from the left bracket.
After the roller is secured, inspect how the roller turns and the clearance between the roller and the bracket, and adjust accordingly.

[13] Disassembling/assembling the front roller (without a groomer)

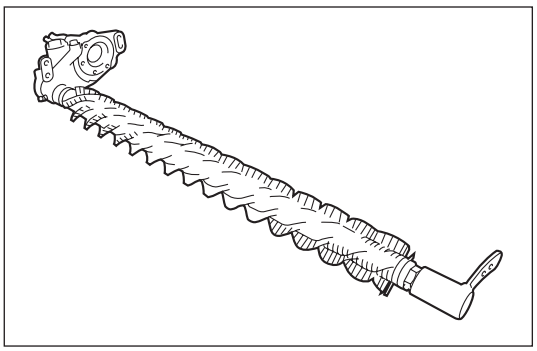


1) The steps are the same as those with the groomer.

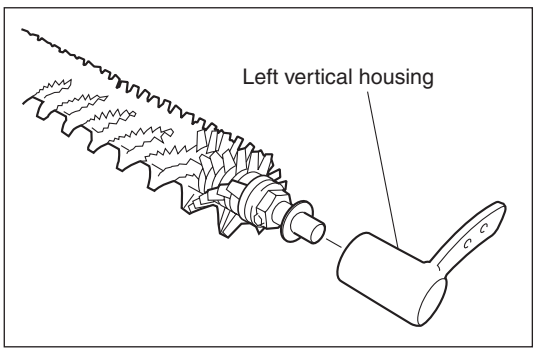


2) The shape of the brackets is different.
Instead of bolts and lock nuts, the hollow set is used.
The hollow set is used on the flat end side of the roller shaft.

[14] Disassembling / assembling / adjusting the front groomer

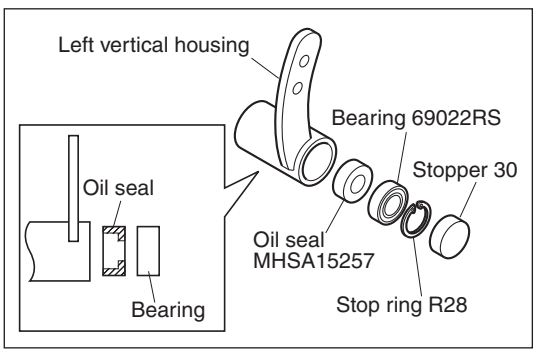


1) Refer to #1 of **Equipped with the groomer** on page 8 for removing the front groomer from the main unit.

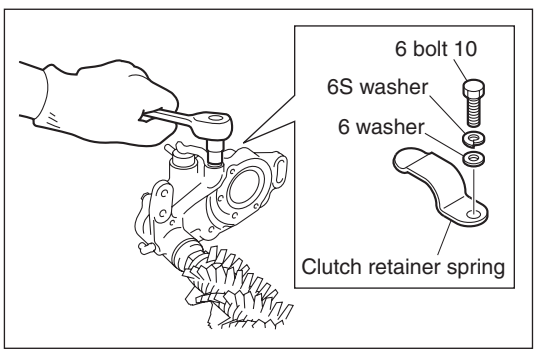


Left vertical housing

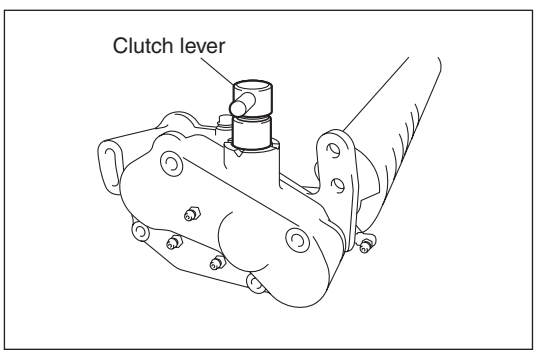
2) Remove the left vertical housing [8-63].



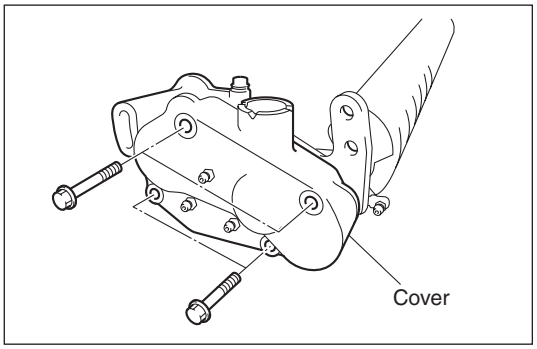
3) Pay attention to the direction of the oil seal [8-27].
Disassemble, assemble, adjust, and replace.
Before assembling them, apply grease to the lip surface of the oil seal.



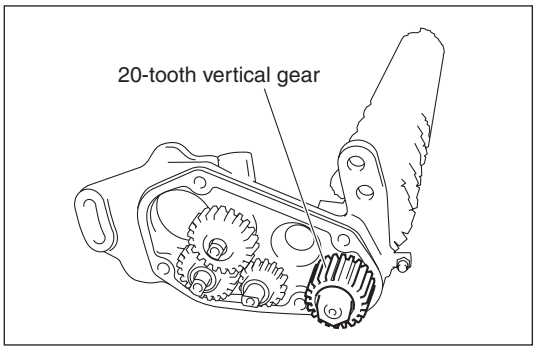
4) Remove the clutch retainer spring [8-8].



5) Remove the clutch lever [8-9].

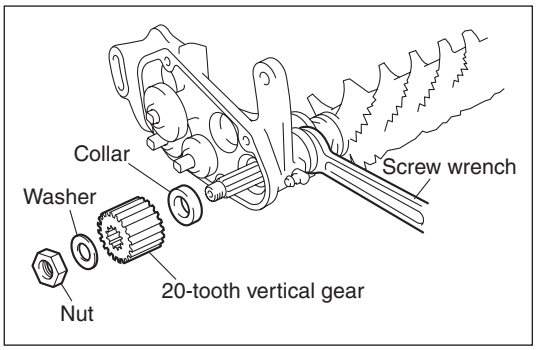


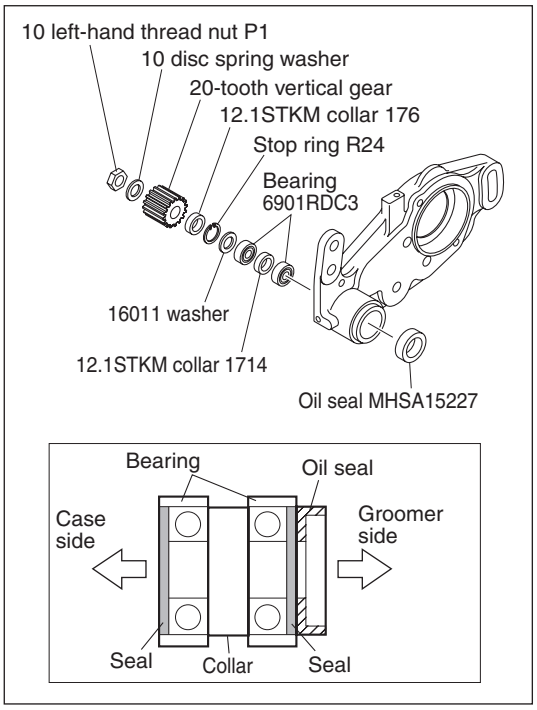
6) Unscrew the four bolts [8-14,15] from the gear case cover, and then remove the cover [8-12].



7) Remove the 20-tooth vertical gear [8-30].

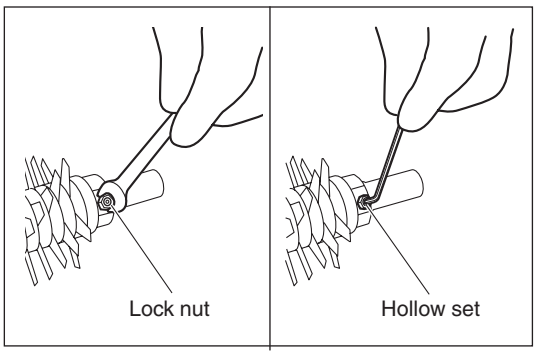
* Lock the nut [8-76] on the groomer using a screw wrench, and remove the nut [8-29](left-hand threaded) which secures the 20-tooth vertical gear.



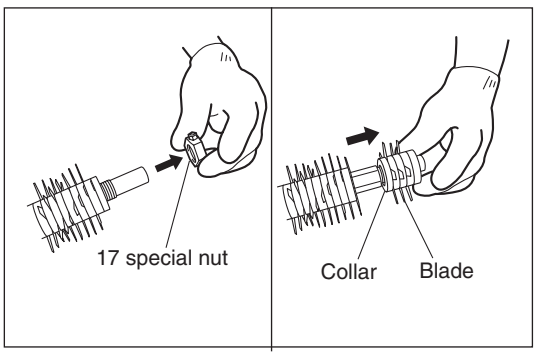


8) Pay attention to the order and direction of the oil seal [8-16] and bearing [8-34].

9) Replace other parts when necessary.
Pay attention to the parts (such as gear) which need to be set in a certain direction.

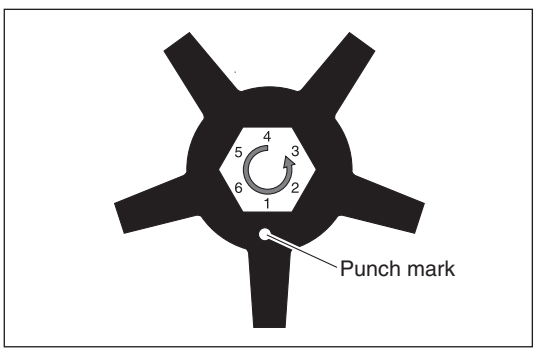


10) Loosen the lock nut [8-72] and then the hollow set [8-71].



11) Secure the 17 special nut (Groomer Blade Locking nut) [8-76] on the spine side using a screw wrench, remove the 17 special nut (Groomer Blade Locking nut) [8-76] on the opposite side first, and then remove the groomer's collar and blade.

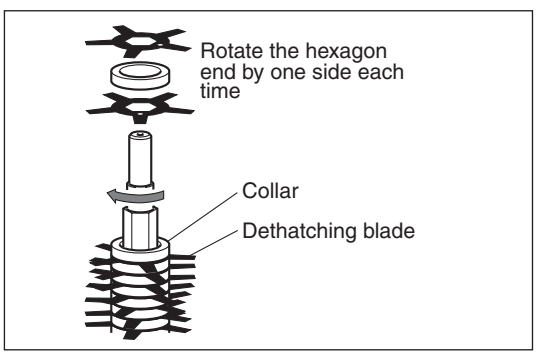
[15] Setting of dethatching blades



1) Make sure that the 17 special nut (Groomer Blade Locking nut) [8-76] is attached on the spline side of the vertical shaft.
   If it is attached, stand the shaft with the spline side on the bottom.

2) First, insert the two collars [8-22], and then continue in the order of one dethatching blade [8-23], one collar, one dethatching blade, and one collar. Insert the two collars at the end.

* Position the punch mark on the dethatching blade facing you, and insert the blade by rotating the vertical shaft [8-20,21,79] clockwise.
   Rotate the vertical shaft's hexagon end by one sixth of a turn each time you insert one blade. (Always position the punch mark facing you.)
   Match the helical angle of the dethatching blade with that of the reel blade.



3) Finally, insert the 17 special nut (Groomer Blade Locking nut) [8-76], secure it with the hollow set [8-71], and lock it with the lock nut [8-72].

* Please do not tightened to much power.
(Torque = 5~10 N • m)

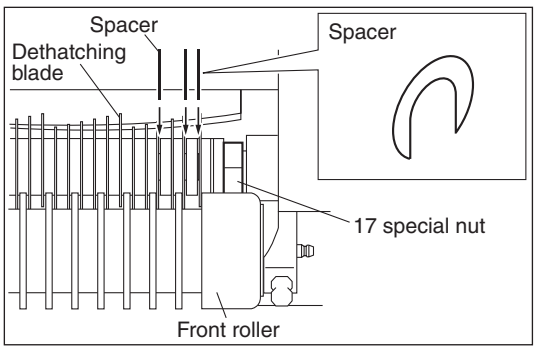
4) Install it in the vertical gear case [8-47] in the reverse order that it was disassembled.

* Apply enough grease to the gear's tooth surface and the needle bearings before installing the cover.(Refer to the Parts Catalog.)

5) Install the left vertical housing [8-63].

* Please refer to #1 ~ #5 of **Equipped with the groomer** section on page 21 for installing the dethatching blades to the main unit.

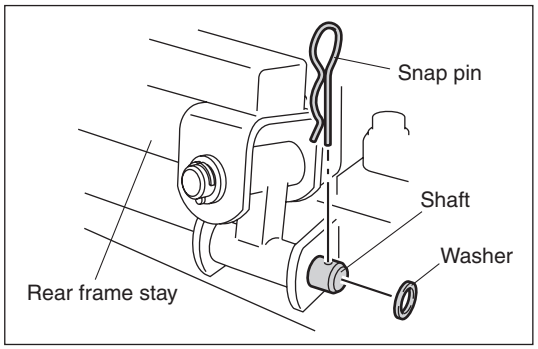
[16] Adjusting the front groomer



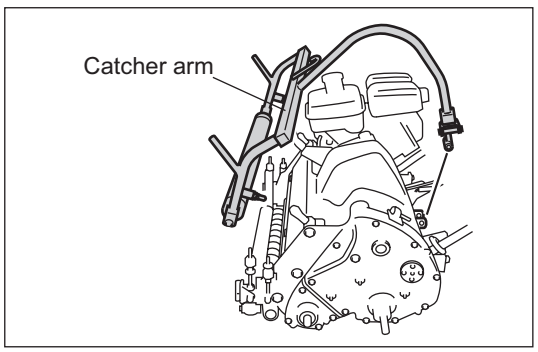
After the front groomer is installed on the main unit, make sure that the two dethatching blades go into each groove on the front roller.

* When adjusting the groomer to the front roller, first start by adjusting with the 17 special nut [8-76] first. If this does not give you the required clearances, then use the spacers [8-24] provided to every space the blades between the groomers on the roller.

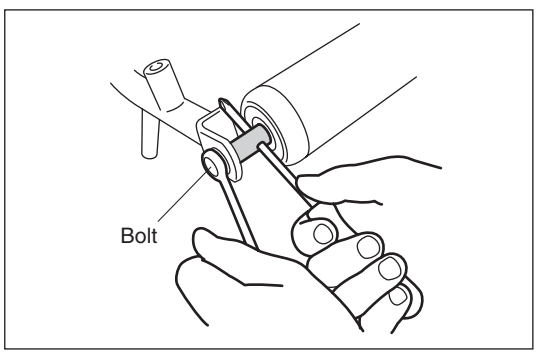
[17] Disassembling/assembling the IGCA roller



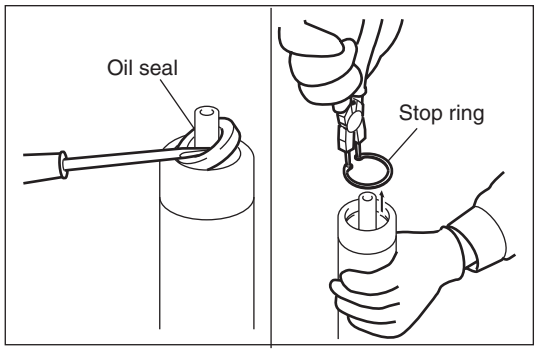
1) Remove the washer [13-10], shaft [13-11], and snap pin [13-12] from the rear frame stay[7-92].



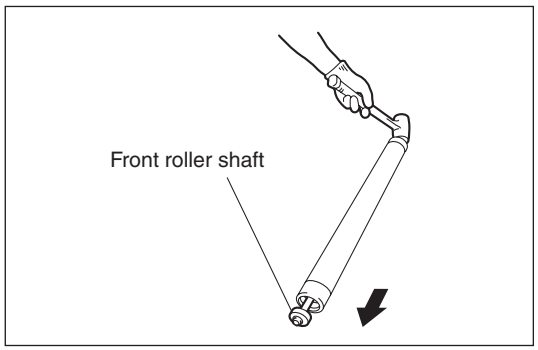
2) Raise the catcher arm and remove it from the mower.



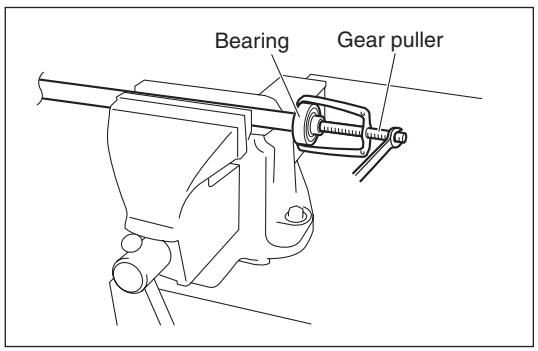
3) Unfasten the bolts [13-15] of both side of the catcher arm. To prevent roller shaft from spinning, slide a screw driver through the hole of the roller shaft and hold for support while loosening bolt. Repeat for both sides.



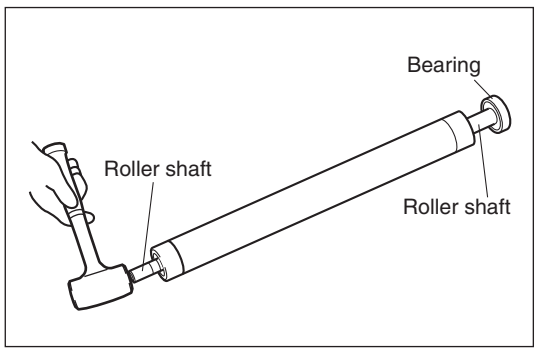
4) Remove the oil seal [13-22] on both sides using a flat-head screwdriver.
Remove the stop ring [13-21].



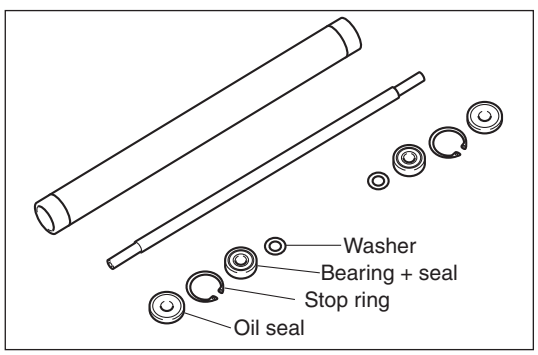
5) Remove the front roller shaft by tapping the end which is sticking out more.

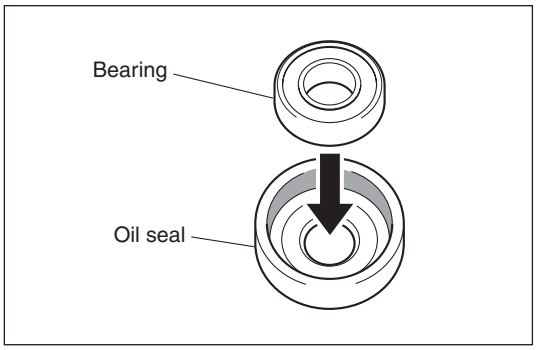


6) Secure the removed front roller shaft on a vice, and remove the bearing [13-19,20] from the shaft using a pulley remover.



7) Remove the bearing on the opposite side by tapping the removed roller shaft into it.

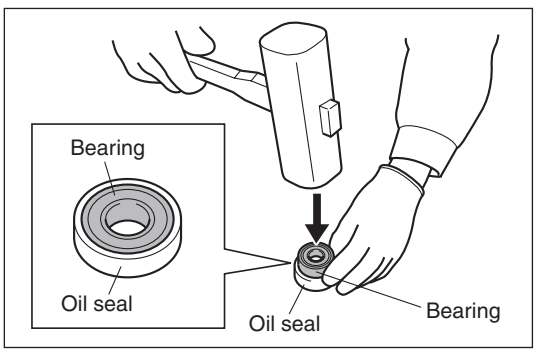


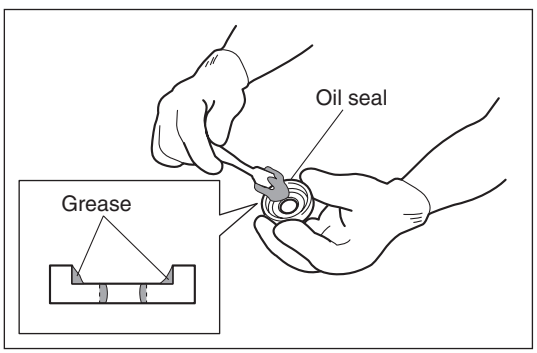


Preparation of replacement parts

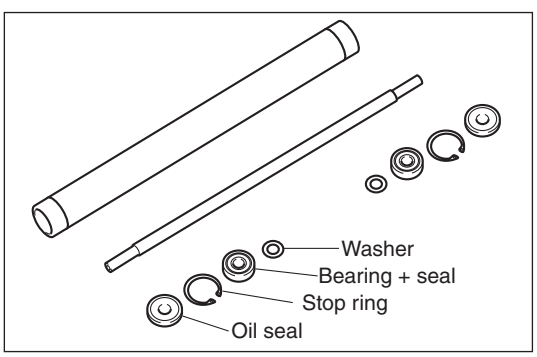
Have the replacement parts ready beforehand.

1) Apply some grease inside the oil seal [13-20]. Insert the bearing [13-19] into the oil seal firmly by tapping it with a wooden hammer.



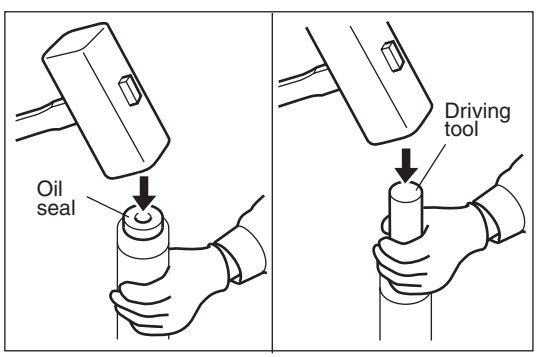


2) Apply grease to the lip surface of the oil seal [13-22] which is to be set on the outside of the roller. (The lip surface is inside the oil seal as shown in the illustration.)

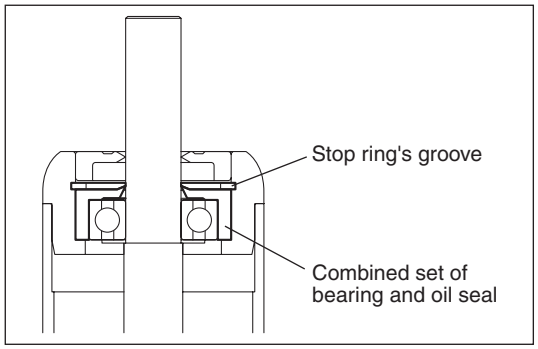


Have a stop ring [13-21] and washer [13-18] available.

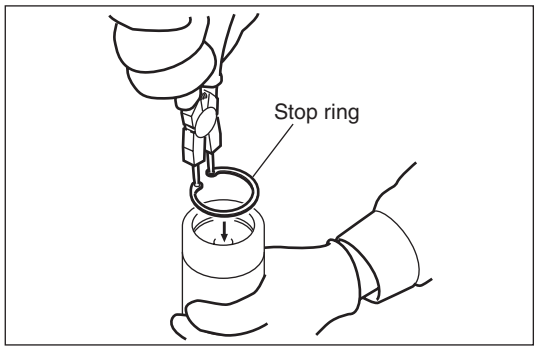
* Inspect each part (such as the roller shaft), and replace them when needed.



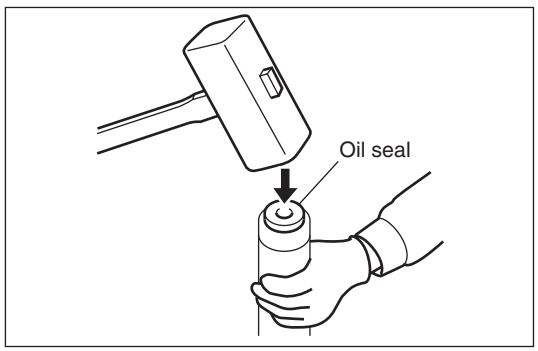
3) Pound in the combined set of the bearing [13-19] and oil seal [13-20] on one side of the roller.
(The oil seal side should face upward.)



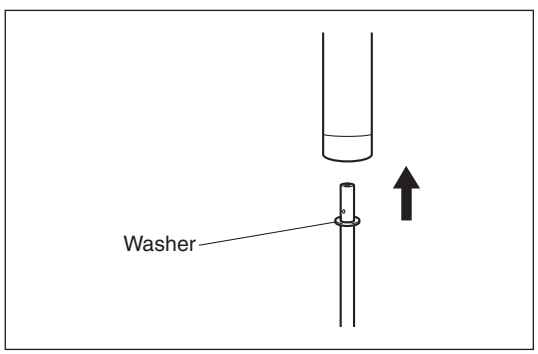
Using a driving tool, pound in the bearing and oil seal set all the way.
(Drive them in below the stop ring's groove.)



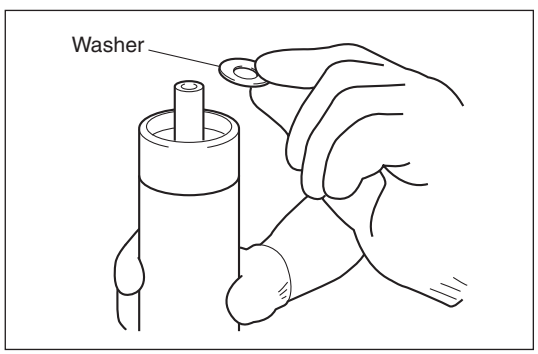
4) Insert the stop ring [13-21].



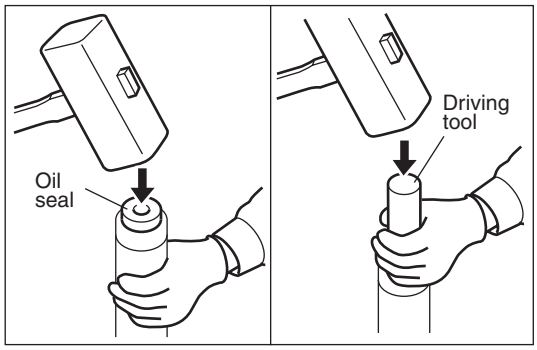
5) Pound in the oil seal [13-22] on the outside. (up to the edge of the roller)

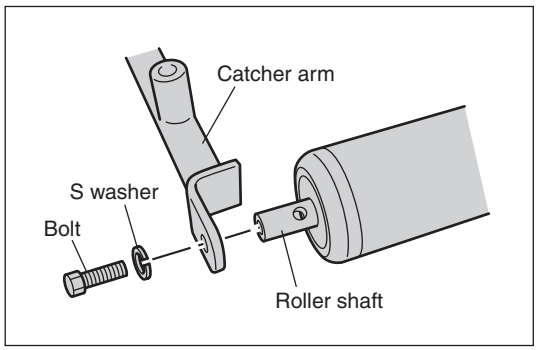


6) Insert the washer from the end of the roller shaft.
Insert the shaft from the end of the roller with no bearing.
Place the roller shaft firmly into the bearing.

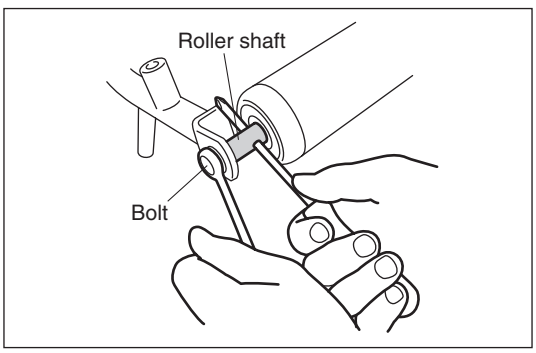


7) After the shaft is inserted, turn the roller upside down and insert the washer [13-18] from the other end of the shaft.
Additionally, using a driving tool, hammer in the bearing [13-19] and oil seal [13-20] set, stop ring [13-21], and oil seal [13-22], in this order .

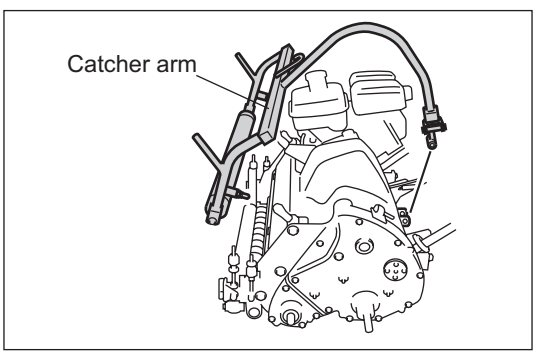




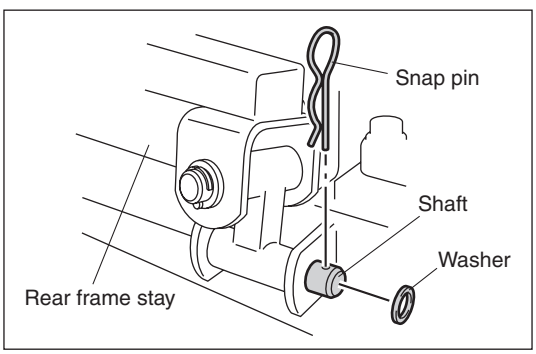
8) Screw bolt [13-15] and s washer [13-16] through hole on catcher arm [13-3] and into roller shaft [13-17]. Repeat for both sides.



9) Tighten and lock bolt [13-15]. To prevent roller shaft [13-17] from spinning, slide a screw driver through the hole of the roller shaft and hold for support while tightening bolt [13-15].

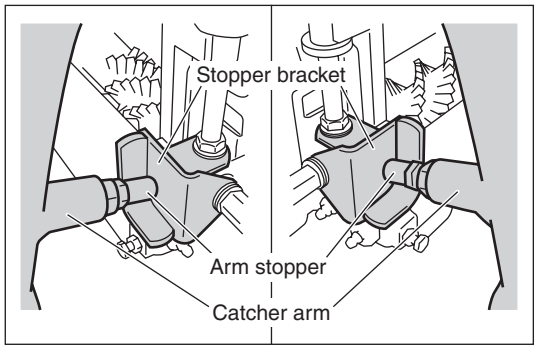


10) From the front of the greens mower, drop the catcher arm into the right position.

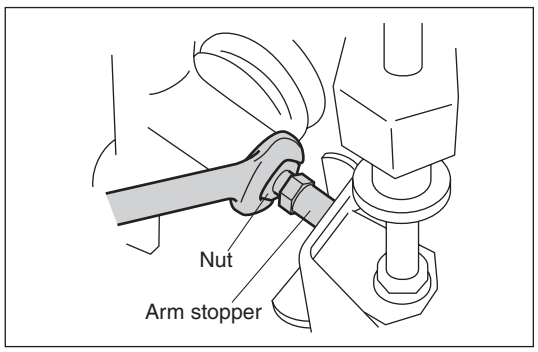


11) Slide washer [13-11] over protruding end of the shaft [13-10], then lock it into the right place with snap pin [13-12].

[18] Ajusting the arm stopper



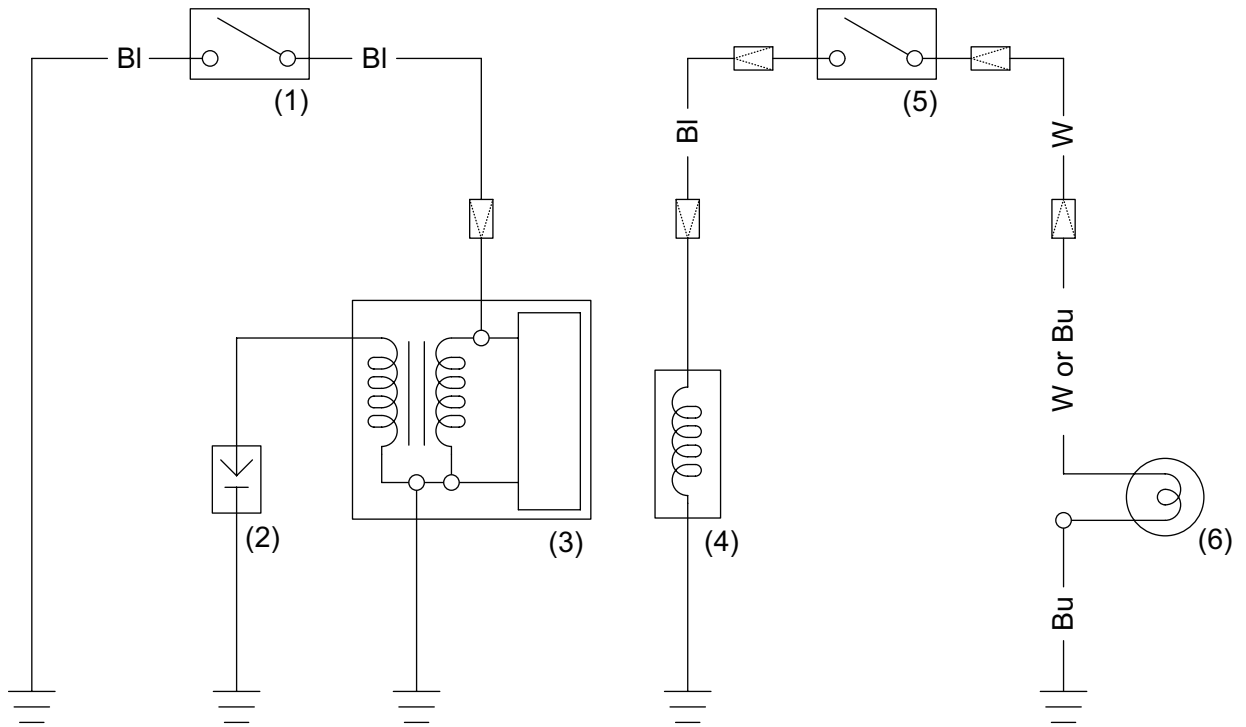
1) Adjust distance of catcher arm [13-3] by tightening or loosening arm stoppers [13-5].
   Recommended space between the arm stopper and stopper brackets [13-6,8] should be 1 mm, when the front roller [3-37] is parallel with the roller [13-23] of catcher arm.



2) Lock the arm stopper [13-5] into desired position by tightening and loosening the nuts [13-4] on both sides.

[19] Reference

Wiring Diagrams (GX120)



Bl	Black
Bu	Blue
W	White

(1)	ENGINE SWITCH	(4)	COIL ASSY., LAMP
(2)	SPARK PLUG	(5)	HEADLIGHT SWITCH
(3)	IGNITION COIL	(6)	HEADLIGHT

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